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LONDON GUARANTEE BUILDING
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finish

MONTHLY TRADE PUBLICATION

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Finishing on metal.

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personnel in companies intimately con-
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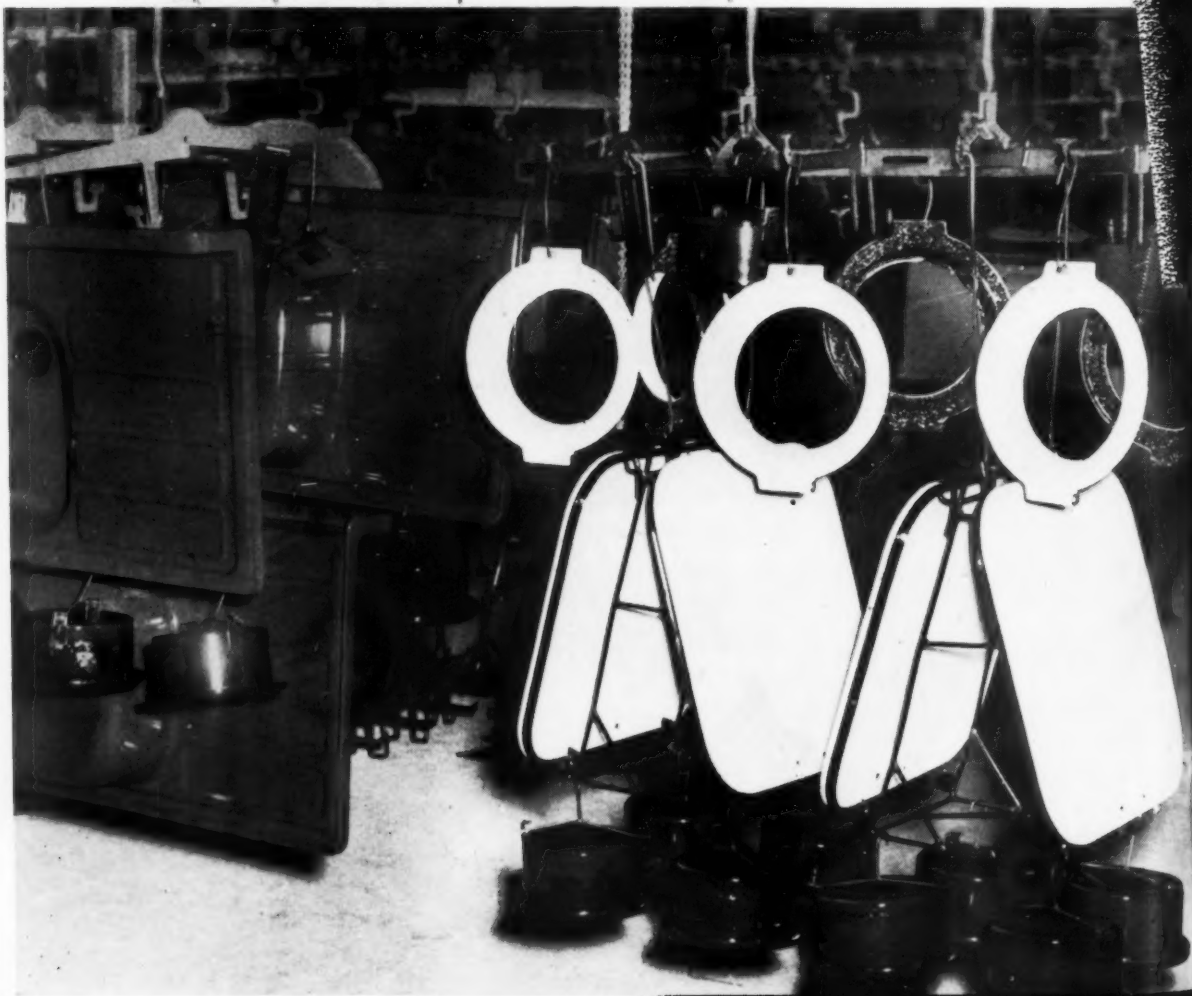
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**VITRIFICATION
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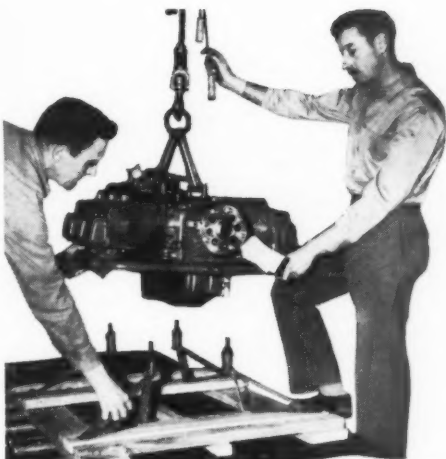
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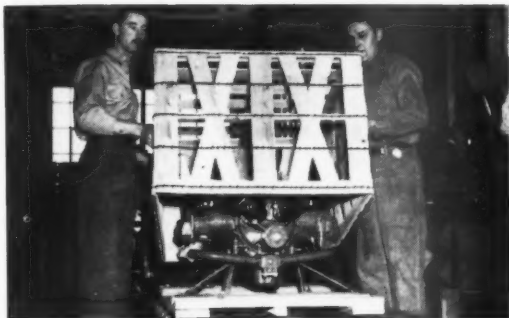
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400 lb. Precision Engines



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Engines are then stacked four-high in warehouse and are tied two-high when loaded into trucks.



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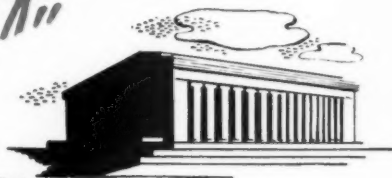
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PRODUCT _____

"develop an all-purpose Porcelain Enamel"

... the O. HOMMEL COMPANY



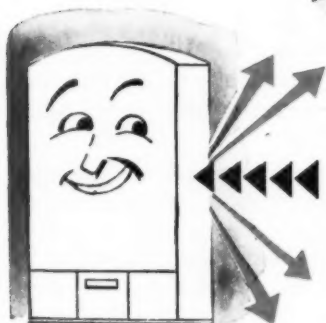
TITE-WITE CAN BE APPLIED EXTRA THIN

Tite-Wite can be applied practically as thin as the best organic finishes! 15-20 gram application weights in a porcelain enamel can be had with Tite-Wite.



Records for application weights, reflectance, acid resistance, bonding strength, chipping, weather and scratch resistance, gloss appeal, greater production and lower costs have been established.

Tite-Wite is easily the greatest current development in porcelain enamel finishes. Compare its advantages, and the savings available to you are apparent by using Tite-Wite. Production men appreciate the better workability of Tite-Wite.



REFLECTANCE READ- INGS OF 75 TO 80.

Reflectance readings of 75 to 80 per cent plus. A real white enamel that can be drained, dipped or sprayed and reduces black edging problem.

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Write today for detailed folder showing the many applications of Tite-Wite, the fruit of many uses.

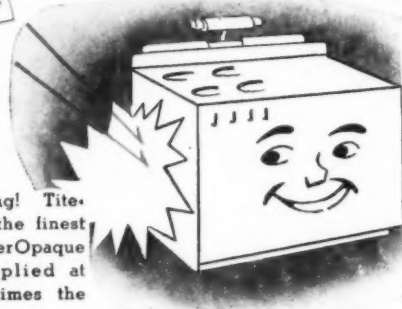
BONDING STRENGTH AND OPACITY NEVER BEFORE EQUALED!

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THE Finish Line

LET'S TALK REFRIGERATORS AGAIN — In "The Finish Line" for October and November, 1944, we pointed to the deplorable situation in which the porcelain enameling industry lost approximately 50% of the porcelain enameled exteriors in the domestic electric refrigeration field. The subject is just as pertinent today, so we quote the following from the November, 1944, "Finish Line."

"This business was not lost to finishes that we could honestly acknowledge as superior. It was, however, lost to a type of finish that had sufficient merit to make it readily salable. In addition, consistent advertising and progressive selling policies were used in establishing these finishes—both with the manufacturer and the retail sales outlets.

A comparison

"If a personal reference may be permitted, we will draw a comparison. In late 1937 your editor built a new home, and into it went a new refrigerator of popular make—an *all porcelain enameled model*. At the same time a banker friend built a new home and into it went a new refrigerator of identical make and model but with a *newer substitute* finish on the exterior.

Look at them now

"Now, seven years later, visitors viewing the all porcelain enameled refrigerator ask if it is new, for it looks exactly the same in every respect as the day it was installed.

"In contrast, the friend's refrigerator, while still presentable, is decidedly 'yellowish' in color and has numerous scratches, mars and stains."

Look at them after ten years

We were playing bridge in the banker's home a few evenings ago when he said, "Come here, Dana, I want to show you something." In a recently decorated kitchen was a glistening porcelain enameled range, a glistening porcelain enameled sink, and a horribly yellow, marked, stained, scratched and partially rusted (at door edges) refrigerator. His first words were, "Why didn't you tell me about porcelain enamel before I purchased this box?"

It goes without saying that he will wait until he can finish NOVEMBER • 1947

get a refrigerator with a porcelain enameled *exterior* before he replaces the present eyesore. It is also probably unnecessary to explain that the refrigerator in your editor's home looks exactly the same as the day it was originally installed *ten years ago*.

Our next-door neighbor

A few days ago I was stopped by my next-door neighbor with the question, "Do you know where we can buy a new _____ refrigerator with porcelain enameled exterior? We must have a larger refrigerator. The little woman has looked them over; she knows the make she wants, but they say, 'We have no porcelain enameled exteriors as yet.' We have seen too many of the painted boxes in the homes of our friends to be satisfied with anything less than another porcelain enameled exterior. Can you help us out?"

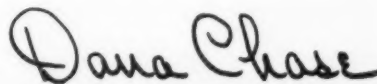
How about your neighbors?

These two examples are unquestionably typical of thousands throughout the country. Every one reading this page can probably cite similar incidents. This means that there is a definite demand—a ready-made market—for all porcelain refrigerators. It is true that *some* all porcelain enameled refrigerators are being manufactured, but, so far, in such minute quantities as to be inconsequential when compared with the demand.

We suggest that every reader encourage his friends to "stick to their guns" and *demand* porcelain enameled exteriors. This word will eventually get back to the manufacturers. •

A word to the manufacturers

Certainly you can market all the refrigerators you can produce today, regardless of the finish, but some progressive manufacturers can steal a big piece of a *permanent* future market by offering *soon* what the experienced refrigerator buyer wants—an *all porcelain enameled refrigerator*.



EDITOR AND PUBLISHER

Century Vitreous Enamel Company

PORCELAIN for Cleanliness, Durability and Lasting Beauty
6641-6661 E. HARRISBURGH AVE. CHICAGO 38, ILLINOIS

October 8, 1947

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CENTURY VITREOUS ENAMEL COMPANY

George Sperry
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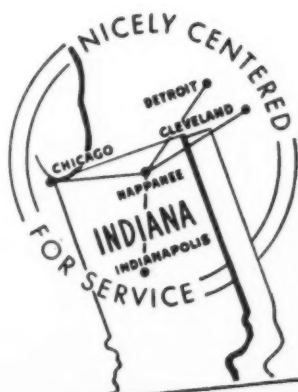
1 Twenty-six years' experience gained from forming and enameling many different parts for leading manufacturers in many different industries.

2 Superb and modern equipment from press room to shipping department.

3 A staff of skilled factory workers, many of whom have seen us grow from a little box furnace shop.

4 An art and engineering department to help create designs for low cost production and for high eye appeal.

Most important, this work goes into a shop which *must* have it. We run a job enameling plant. We make no finished products. We are out of business if we don't please our manufacturing customers.



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VITRO TITANE

This special formula titanium compound is designed for use in porcelain enamel cover coats to promote high opacity. It is acid resistant.

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THE VITRO MFG. CO.

Corliss Station,

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Branch Plant
Canonsburg, Pa.

California Office:
16 California St., San Francisco, Calif.

A two continuous furnace plant for stove work and jobbing

a highly flexible enameling plant geared to high speed production of flatware

illustrated with finishfotos exclusively

By Val J. Cichowski • WORKS MANAGER, VITREOUS ENAMELING DIVISION,
THE CLEVELAND COOPERATIVE STOVE CO., CLEVELAND, OHIO



Our Plant No. 3, the Vitreous Enameling Division, is laid out and equipped for the high speed production of "flatware" as used for domestic ranges. It is keyed to the production capacity of two "U"-type continuous furnaces for steel and a single box type furnace for cast iron parts. Both continuous furnaces have a 31'-11½" firing zone heated by two gas-fired burners.

The plant is installed in an all-steel building 102' x 378' which formerly served as a steel warehouse. In engineering the present layout, advantage was taken of the extremely high (40'-0") ceiling so as to overcome certain limitations imposed on engineering due to the limited width of the building and the positions of the older (No. 1) continuous furnace, the mill room, the pickle room, the ground coat line, and the box furnace, all of which went into the makeup of the original less efficient setup.

By designing the No. 2 continuous furnace with a short "L" on the open end, because of the limited width of the building and the position of the No. 1 continuous furnace, and installing a 1200' overhead monorail conveyor as a service conveyor for the entire plant for the delivery of ware in process and finished ware to point of use, we now have extreme flexibility. The service conveyor eliminated practically all manual handling except at transfer points where the spaces were held to a practical minimum based on the size of parts to be run.

With top production, No. 1 con-

tinuous furnace may be used for ground coat and the No. 2 continuous furnace for white finish coat, with all

operations keyed to give continuous production flow. Conveyors are so arranged that either No. 1 or No. 2

Cycle No. 1

- | | |
|---|---|
| 1. First pickle shift. (Pickles ware taking white cover coat finish.) | 12:00 (midnight) to 8:00 a.m. |
| 2. First ground coat shift. (Works on ware pickled by first pickle shift.) | 6:00 a.m. to 1:45 p.m. (1:45 p.m. to 2:00 p.m. used to prepare line for next shift.) |
| 3. First shift white spray line. (Works on ware put in ground coat by first ground coat shift.) | 7:00 a.m. to 3:30 p.m. (½ hour taken for lunch. 3:30 p.m. to 4:00 p.m. used to make line ready for next shift.) |
| 4. First brushing shift. (All female help.) | 7:30 a.m. to 4:00 p.m. (½ hour taken for lunch.) |
| 5. First crew white, furnace No. 2. (Ware hangers and inspectors) | 8:00 a.m. to 4:30 p.m. (½ hour taken for lunch.) |
| 6. First shift, repair men. | 8:15 a.m. to 4:45 p.m. (½ hour taken for lunch.) |
| 7. First shift, packers, graders and matchers. | 8:30 a.m. to 5:00 p.m. (½ hour taken for lunch.) |

Cycle No. 2

- | | |
|--|---|
| 1. Second pickle shift. (Continues work of first pickle shift and starts on ware taking ground coat stipple finish.) | 8:00 a.m. to 4:00 p.m. |
| 2. Second ground coat shift. (Finishes ware taking white cover coat finish and does all ground coat stipple ware.) | 2:00 p.m. to 9:45 p.m. (9:45 p.m. to 10:00 p.m. used to prepare line for next shift.) |
| 3. Second shift. (White spray line.) | 4:00 p.m. to 12:30 a.m. (½ hour taken for lunch.) |
| 4. Second brushing shift. (All female help.) | 4:30 p.m. to 1:00 a.m. (½ hour taken for lunch.) |
| 5. Second crew white, Furnace No. 2. (Ware hangers and inspectors.) | 5:00 p.m. to 1:30 a.m. (½ hour taken for lunch.) |
| 6. Second shift, repair men. | 5:15 p.m. to 1:45 a.m. (½ hour taken for lunch.) |
| 7. Second shift, packers, graders and matchers. | 5:30 p.m. to 2:00 a.m. (½ hour taken for lunch.) |

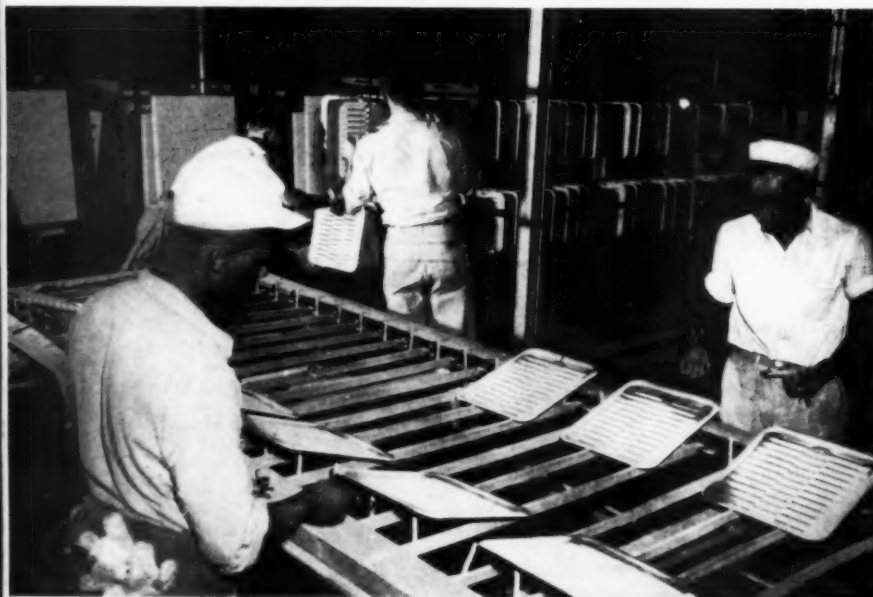
Cycle No. 3

- | | |
|--|---|
| 1. Third pickle shift. (Pickles ware taking ground coat finish and black enamel finish.) | 4:00 p.m. to 12:00 (midnight) |
| 2. Third ground coat shift. (Works on ware pickled by third pickle shift.) | 10:00 p.m. to 5:45 a.m. (5:45 a.m. to 6:00 a.m. prepares line for first ground coat shift.) |

Cycle No. 3 completes our day at present.

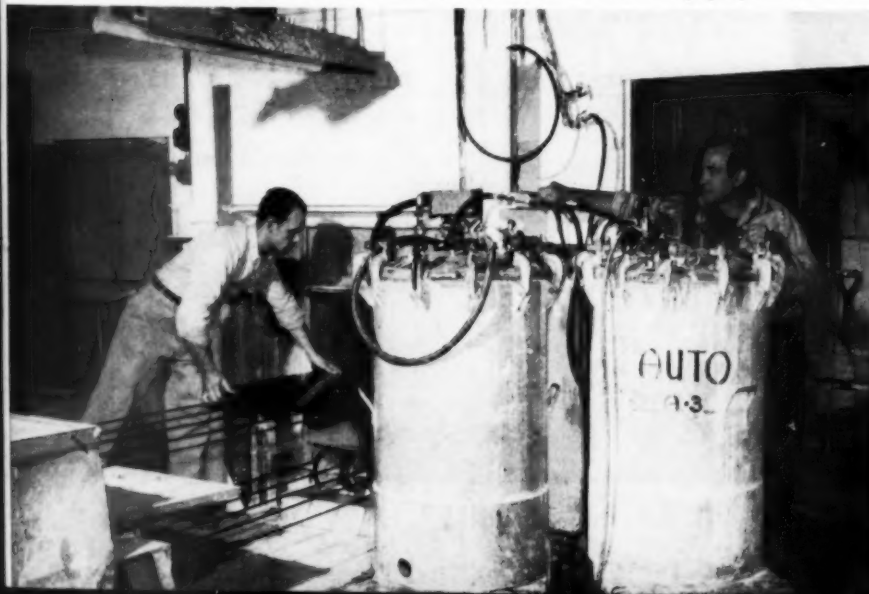


Preparing to pump enamel from storage container through "double check" to dip tank.



Loading furnace chain from ground coat dryer conveyor. Note dryer conveyor "tooling."

Man on right is operating pressure tank change over valve at load end of spray machine.



furnace may be used independently for all steel ware, both ground coat and cover coat if for any reason the other furnace is down.

For top production our shifts are arranged in three cycles:

In presenting a detailed description of our plant operations, I shall attempt to stress points which may not be common to most plants.

Metal preparation

In our pickle room we use conventional cleaning and pickling practice in an open tank type, manually operated installation. There are nine tanks including a tank dryer. They consist of two alkaline cleaners (both boiling), hot water rinse (180°-200° F.), cold water rinse (continuously overflowing and supplied with fresh water), acid pickle (sulphuric acid 6-8%), cold water rinse (continuously overflowing), two neutralizers (soda ash - borax, 9 to 1 ratio, 130-140° F.) and the tank dryer (with open gas flame from ribbon type burners). Our routine in the pickle room is to start the cycle at midnight and run all metal which is to get finished in white. This metal is then followed with all parts which are to get stipple, ground coat, and black finish only.

One neutralizing tank is run through a 24-hour cycle and then dumped, with an immediate shift of production to the alternate neutralizer tank while the first tank is prepared with new solution. The reason for this is that we get a precipitate from our hard water, and by running our metal for white first and dumping the tank after a 24-hour cycle, we eliminate difficulties which might otherwise arise on white finish ware.

Should filters be installed, one neutralizer tank will suffice; the alternate tank can be used as a nickel tank.

Pickle room tanks are elevated above main floor level. The pickle room is closed in so that the roof forms an overall hood. Two 5 h.p. bifurcator fans exhaust steam and fumes vertically through the roof. To prevent dirt, iron salts, etc., from falling from fans and stacks, baffles 6' x 3½' are mounted 4'-0" below

and under each stack and fan opening.

As in some enameling plants, we had the problem of keeping the solutions in our tanks up to temperature with a boiler of insufficient capacity. We couldn't get enough steam from the 40 h.p. low pressure boiler, so we used this boiler for the acid and neutralizer tanks and installed gas immersion heaters on the cleaner tanks. We now have no difficulty in keeping all tanks up to proper temperature.

Enamel operation

Our mill room houses six mills ranging in capacity from 300 lb. to 2,000 lb. An overhead balcony is used for frit and material storage. Mill loading is from the balcony through chutes designed to lower inside the millhead openings. All mills are water cooled.

Slip is unloaded from the mills by air through a 40-mesh vibrating screen and magnetic separator to 50 gallon *porcelain enameled* storage drums. Two of the vibrator screen, magnetic separator units are set up on portable dollies so that one can be used exclusively for cover coat and the other for ground coat.

We plan to install overhead storage tanks with agitators which will change only slightly the routine outlined.

In unloading the porcelain enameled steel drums, another type of portable cleaning unit, which our mill room men have dubbed the "double check" is used. This unit consists of a centrifugal sieve, pump, closed type magnetic separator, rectifier for the filters, and fuse boxes for the centrifugal sieve and pump. The components are mounted on a specially designed portable steel truck for which only one power outlet is required. Here, again, two complete units are provided—one for cover coat and one for ground coat.

The ground coat unit is used both for the transfer of milled enamel from storage drums to dip tanks, and for reconditioning the tanks. The routine on this is to empty a dip tank after every shift, pumping the enamel back into the storage barrels so that the tank can be cleaned and

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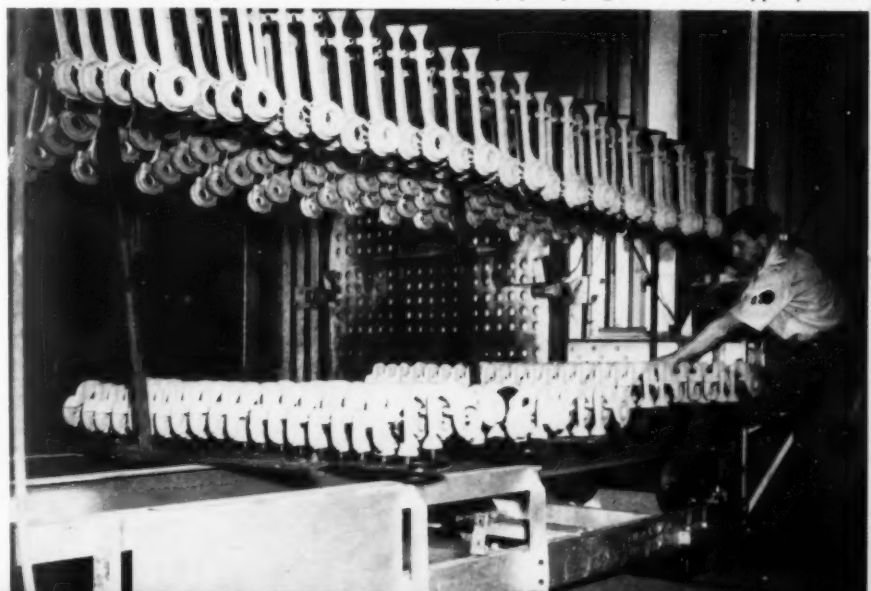


Furnace control panel includes equipment for "straight line" heat control testing.



Loading cover coat furnace chain with ware from racks on parallel brushing conveyor

A typical load of cast iron burners is ready for firing in the box-type furnace





Color matching of range parts is accomplished electrically. Readings are taken direct on screen above equipment.

all enamel for the fresh tank passes through the "double check." Likewise, all white enamel goes from the mill storage through the "double check" to pressure tanks.

Control laboratory

The control laboratory is adjacent to the mill room and frit storage. It houses all the essential equipment for checking of materials and control of operations. Titrating equipment for the pickle is positioned over a bench topped with white porcelain enameled panels. Nearby are the rotap machine, electrical thickness gauge, microscope, reflectometer for opacity and color checks, multiple unit hot plate and balances used for checking fineness of milled enamels, weight of application, "set" of enamels and specific gravity of enamels.

No detailed description of mill room practice, data or tests will be

given as we follow pretty much standard approved practices in this department.

Ground coat application

Ground coat is dipped simultaneously from two tanks paralleling (one on either side) the dryer feed conveyor. Our ground coat dryer is unusually wide so that the flat type conveyor, combining pins on knife-edge cross bars, will handle all of the parts from two dip tanks. Open flame gas is used for heating the dryer with booster heat furnished by the recuperator from No. 1 furnace.

As the conveyor leaves the 35' ground coat dryer, it runs parallel to and only 3½' from the loading end of No. 1 furnace chain, and reaches a point only 4' from the loading station of the No. 2 furnace chain.

We use "soft" ground coat for

stipple ware and ground coat only ware, firing it from 1520° to 1540° F. A harder ground coat is used for white ware, fired at from 1560° to 1580° F. The "soft" ground coat is fired at 8' per minute and the hard ground coat is fired at 5½' to 6' per minute (hot zone of furnace is 30'-11½").

Fired ground coat is inspected at the point of transfer to the shop conveyor. The shop conveyor carries any rejects to the repair department and OK'd ground coat fired ware to finish coat spray.

Automatic spray conveyor runs 34' per minute

Visitors to our plant are usually interested in the conveyor speed of our automatic spray equipment used for the application of all cover coat. At present the conveyor is operating at 34' per minute. Enamelers who are operating automatic spray equipment will immediately recognize that if we were to try to apply a 42-45 gram application of cover coat, it would be necessary to use as high as 80 lb. air pressure at the pressure tanks. This makes it extremely difficult, or impossible, to get as smooth a coating as we demand on our finished ware. The reason we can maintain such a high conveyor speed is that we do not apply the complete coat on the automatic.

The method we use to maintain the high production speed is to apply only 25-30 grams on the automatic equipment, and follow this with a manual overspray for the balance of the required thickness.

Instead of having the usual two sprayers in the staggered manual booths for spraying flanges (one sprayer in each booth), we employ three sprayers—the two customary ones for flanges and the third sprayer for the overspray on the flat surfaces. It will be clear that by the addition of one operator we greatly increase the total capacity of the automatic machine. Then, too, the pressure required at pressure tanks feeding the automatic can be reduced to 55 lbs.

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See plant layout . . . Pages 32 & 33

Cinderella gets competition

stylish tables with porcelain enameled tops for the modern kitchen

By Matt E. Heuertz • FINISH EDITORIAL STAFF

DISPLAY advertising has made the average American housewife so conscious of the "kitchen beautiful" that she has become an authority on modern design for kitchen furnishings.

The housewife can be impressed on the durability of porcelain enamel as a work surface for table tops, but often the design of the complete unit is the basis on which she makes her final selection.

Several kitchen appliance manufacturers have recognized this fact, and are cashing in on the practical application of it by turning out modern streamlined tables with porcelain enameled tops.

One such firm is the National Manufacturing Corporation, affiliate of the Doehler Metal Furniture Company, Inc., New York, N. Y., manu-

facturers of handsome yet practically styled "Rainbow" metal kitchen and dinette sets. National Manufacturing's stylish new kitchen furnishings were displayed during the past year at leading American furniture centers, including the Southern Furniture Exposition Building, High Point, North Carolina, the Furniture Mart, Los Angeles, Calif., and the Furniture Mart, San Francisco, Calif.

Designed by Alfons Bach, the "Rainbow" table with the porcelain enameled top is an answer to the challenge which Jay Gary, editor, *Furniture Age*, tossed at the porcelain enameling and furniture industries in an article published in the April, 1945, issue of *finish*.

In the article, "Cinderella Was a Glamour Girl Compared to Porcelain Top Tables," Gary agreed that

porcelain enamel was an excellent material for kitchen table tops. However, he added that "it had received a terrific black eye with the average American housewife because of the atrocious tables on which it usually appears."

Gary's highly critical remarks were accompanied by photographs of tables which apparently were so designed that "the chief objective seems to be to use as much hardwood as possible and distort this good wood into shapes that only its maker could love."

The only logical remedy for such an unhealthy situation had to be better styling. And it would appear that much progress has been made in modernizing the design of kitchen tables since Gary's article was published in *finish*.

Styled by a noted designer, this streamlined kitchen table with a porcelain enameled top fits right in with the scheme of the "kitchen beautiful."



Bright annealing for cleaning kitchenware prior to porcelain enameling

an outline of equipment, costs and results based on
16 months' experience

By *Albert R. Mallonn* • THE REPUBLIC STAMPING & ENAMELING CO., CANTON, OHIO

FOR the past 16 months at Republic we have been using controlled atmosphere, or bright annealing to replace cleaning and pickling of kitchenware prior to porcelain enameling. This method has worked out satisfactorily from a cost standpoint as well as quality of surface acquired.

What is bright annealing in lieu of pickling? It consists of the heating of metals to a temperature high enough to burn off any foreign matter that may be deposited thereon in an artificially manufactured reducing atmosphere. The atmosphere developed for this purpose not only prevented harmful surface reactions from taking place, but chemically brought about the restoration of oxidized surface metal. The resulting bright, pure metallic surface is responsible for the name "bright annealing" applied to this process.

We are using a roller hearth type furnace with a heating chamber 18 ft. long and cooling chamber 70 ft. long. It is rated at 325 KW and can be operated at temperatures up to 2100° F. The 70 ft. cooling chamber is water-jacketed which lowers the temperature of the work to handling temperatures at the discharge end. Handling is reduced to a minimum by the complete automatic operation

and through the use of electric eye control and conveyors. The furnace has a 2000 CFH atmosphere convertor. The cost of such a furnace ranges from \$35,000 to \$50,000. The width can be greatly increased thereby doubling the operation of the furnace with a very small increase in cost.

Cost factors

The greatest cost in operating the furnace is fuel for heating, which in our case is electricity. This in most cases will be considerably more than where natural gas is used. Over a period of three months our average cost of electricity is 5.5 KW per 100 sq. ft. of metal using both sides, figured at .015 per KW equals .083 per 100 sq. ft. By using transfer tables and return conveyors our labor cost is .07 per 100 sq. ft. The natural gas used in the convertor, figured at 45¢ per 1000 C.F., costs .005 per 100 sq. ft. Totalling these figures we have a total of 15.8¢ per 100 sq. ft. Comparing these to our pickling costs, which are 20.3¢ per 100 sq. ft. of metal cleaned and pickled, we find savings of approximately 25%. These savings are due largely to the fact that one man does all the loading and unloading and no dividers are necessary. The ware can be

tightly nested or stacked, which in our case is six pieces high.

The furnace used in arriving at these costs has a door opening of 30" wide by 13" high with a total overall length of 102'. These costs may vary some on different size furnaces, namely, one man may be able to operate two 30" wide furnaces where it will require two men to load a 60" furnace using a return conveyor.

Taking an average of the last three months production on the above furnace, we have annealed 2276 sq. ft. of metal (weighing 754 lbs.) per hour.

We are told by furnace manufacturers to figure \$900 per year for maintenance. This should be a safe figure to use as our repairs have not run this high.

There has been considerable talk that the metal has to be washed before going through the atmosphere anneal. This is not true as long as the ware is not coated with a pigmented compound, heavy oil or grease. Oil soap and soluble oils have been used with good results.

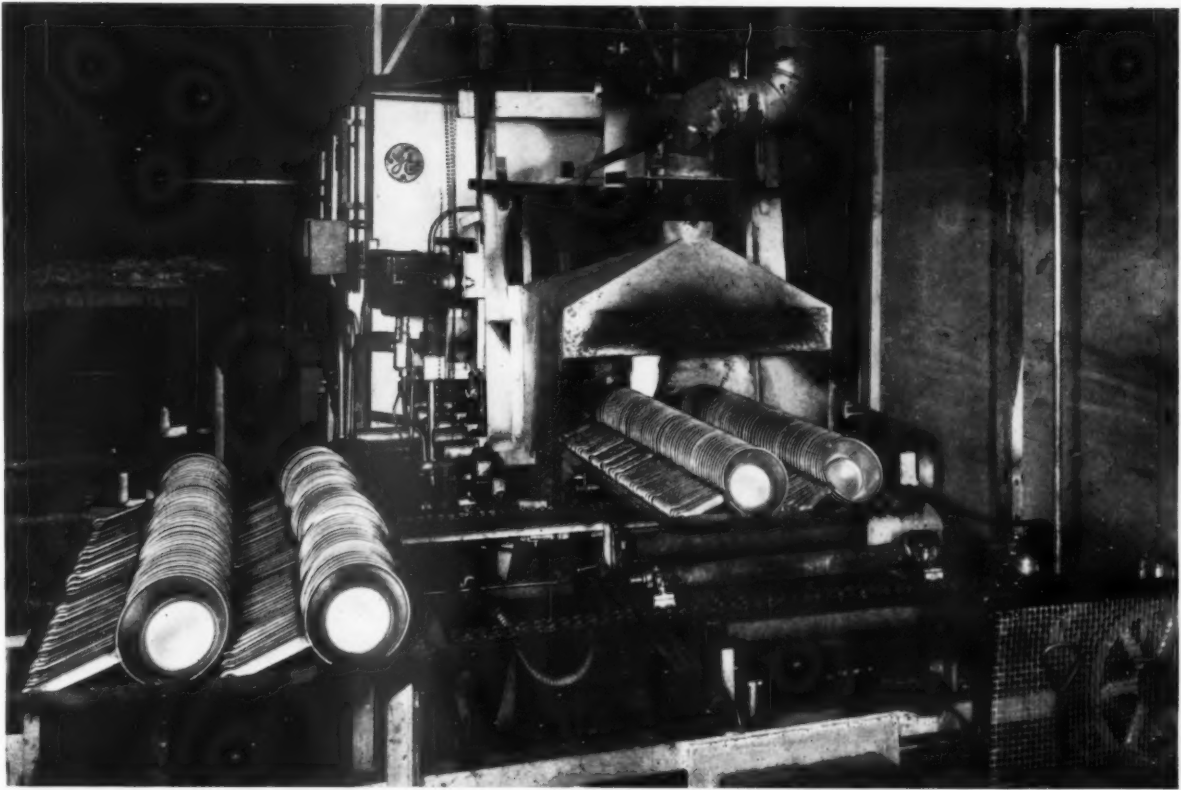
Three-fold cleaning action

The cleaning action is of a three-fold nature. First, the furnace tem-

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Photo shows pans processed by old and new method. Center pan was processed in pickling tanks while right pan was put through furnace.



Above: This view of the furnace entrance shows a tray of pans about to pass through a curtain of flame before entering furnace. Below: This photo of the exit of the furnace shows the cooling chambers and conveyor.

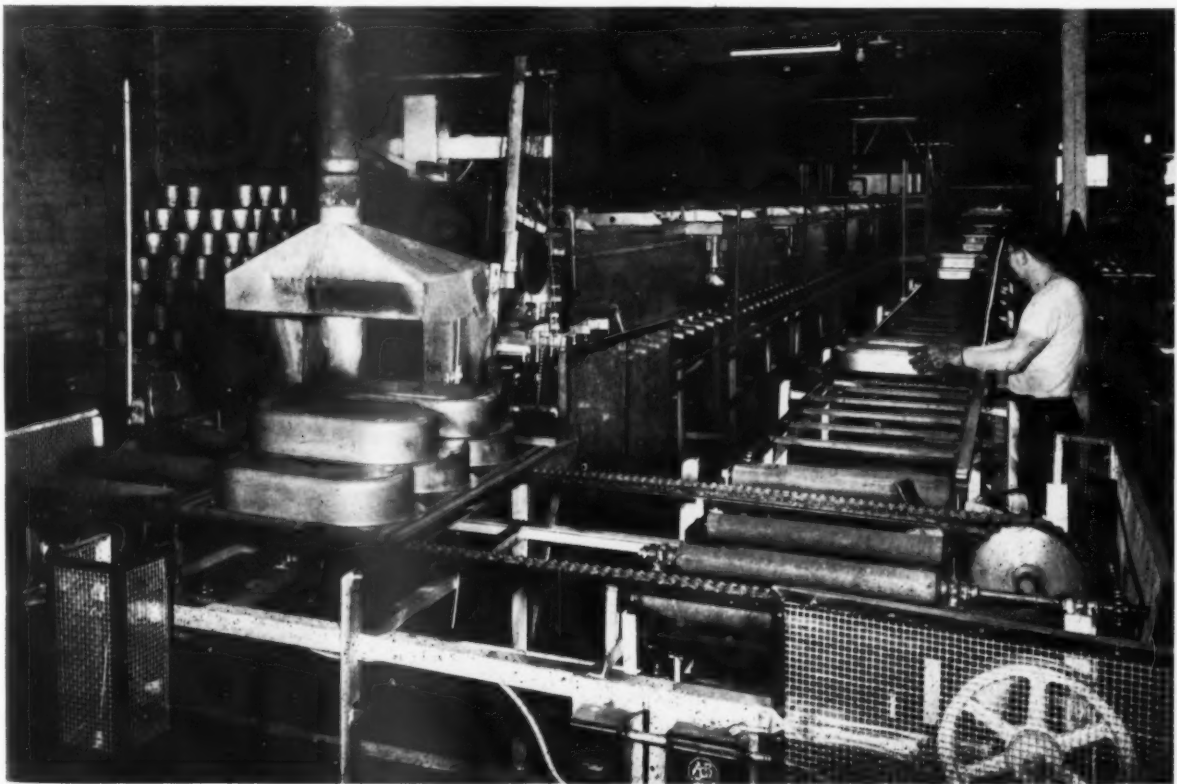




Photo shows Forum group standing on steps of Campbell Hall on Ohio State University Campus.

finishfoto

Program report of ninth annual PEI forum

(continued from October, 1947, finish)

with authors' resumés and excerpts from complete papers

Spray Pickling (EX)

By H. C. ELLINGER

With the advent of spray cleaning and pickling for porcelain enameling, this phase of the enameling process has been greatly changed. The machine for this spray cleaning and pickling in general consists of a horizontal tunnel through which the ware is carried by an ordinary monorail conveyor. Hooks extending down from the conveyor through a slot in the top of the tunnel fasten on to baskets into which the ware is loaded. As the baskets are conveyed through the tunnel the various solutions are successively sprayed onto the ware by a system of spray nozzles, pipes and pumps.

Beneath the tunnel tanks are placed at each stage in which the solution drains from the ware. Thus the solution in each stage is circulated by means of a pump, through the pipes to the sprays. All solutions are kept at a predetermined constant temperature automatically. Ventilation ducts connect into the top of the tunnel through which all steam and fumes

are drawn off by fans and forced through a cold spray. Thus the exhausted air is free from either acid or alkali fumes. This is very important in some localities. The ventilation is so efficient that it is not necessary to put the machine in a separate room as has been the normal practice but it can be placed at any convenient location in the plant.

The efficiency of the sprayed solutions materially reduces the time ordinarily required for immersion pickling. Also the cleaner concen-

tration is considerably lower. The time and temperature schedule for this particular process is shown.

Tooling and special equipment

The tooling consists of special baskets which hold two food compartment liners and various amounts of other small parts. All ware is processed in these baskets. This is done to prevent swinging while ware is going through the sprays. All solutions are heated by steam coils and the temperature is controlled by elec-

Time and Temperature Schedule

1. Emulsion cleaner	35-1	190° F.	1 min.
2. Fresh water rinse to drain			1/2 min.
3. Alkali cleaner	2 oz./gal.	190° F.	2 min.
4. Three stage rinse:		cold	1 min.
Last stage, fresh water spray			
Second stage, tank recirculated			
First stage, to sewer			
5. Sulphuric acid	7%	170° F.	5 min.
6. Acid rinse (recirculated)		cold	3/4 min.
7. Nickel solution	1 oz./gal. 3 pH	100° F.	3 min.
8. Sodium cyanide-caustic neutralizer	4% Na ₂ O	130° F.	1 1/2 min.
9. Borax rinse (recirculated)	0.15 NaOH	130° F.	1 1/2 min.
10. Dryer		225° F.	4 min.

trical thermohm indicator controllers in conjunction with air operated valves in the steam line. Also provided is a six point temperature recorder which keeps a record of all solution temperatures. The nickel tank is equipped with a pH recorder which provides a constant record of the pH value of this solution at all times. The nickel and neutralizer solutions are equipped with filter equipment which keeps the solutions clean. The dryer is a direct gas-fired type. The recirculated air is forced through jets at high velocity onto the ware. The main return line from the steam coils is equipped with an indicating purity controller. In case of either acid or alkali contamination in the condensate line, the condensate is automatically bypassed to the sewer.

With any appreciable production the *operating cost* per square foot of ware on any so called automatic machine should be much less than the hand operated pickle because of the low labor requirement.

Although the machine described has been in operation for several months, not enough experience has yet been obtained to determine the amount of maintenance necessary for continuous production. However, the indication is that aside from the usual amount of spray nozzle cleaning and pump repairs, the maintenance on this machine will be nominal.

Advantages

Some of the advantages of the spray type pickling over immersion or tank pickling can be listed as follows:

1. The hanging of ware is much simpler since there is no chance for entrapped air or pocketing. The only requirement is that the ware be posi-

tioned in such a way that it will drain.

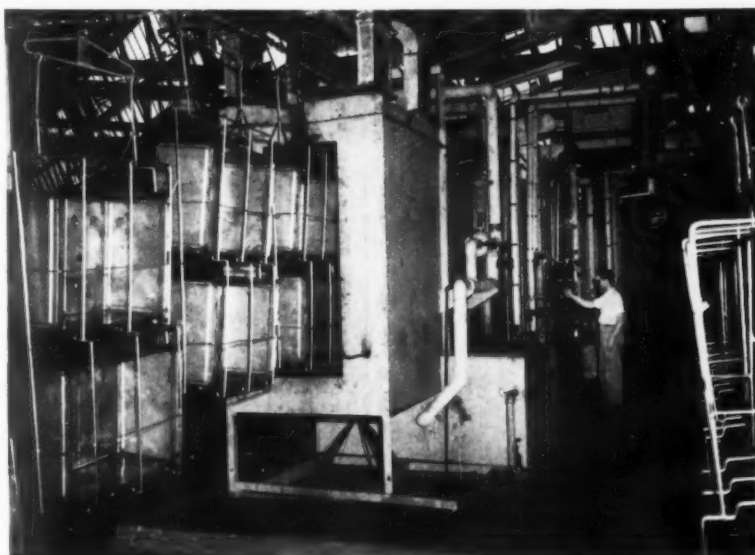
2. The exact cycle is automatically controlled, which eliminates the human factor.

3. The amount of solution required for each stage of the process is considerably less than required for tank pickling. This reduces loss when a tank is discarded.

4. Spray cleaning is much more efficient and thorough than immersion cleaning. The mechanical force

sprayed solution. From experience we can now say that the deposit of nickel on the ware is equally as uniform as immersion pickling and a proper deposit is acquired in much less time.

8. The conveyor carrying the ware through the machine is an ordinary monorail conveyor and can be routed to any desirable point. Thus it is possible and sometimes advantageous to route this conveyor from the press shop, through the pickle machine,



Ware entering continuous pickling machine.

of the solution from the spray nozzle greatly aids cleaning.

5. The spray rinses are more effective than immersion rinses. This is an important factor in any pickle cycle.

6. The ware does not dry between any of the stages in the cycle. This greatly improves the quality of the pickled ware.

7. There has been some doubt about proper nickel deposit from a

and to the point of enamel application. This not only affords a means of transportation but saves labor. Since the time cycle is much shorter than other types, this machine is smaller and occupies less floor space.

In general, the spray type cleaning and pickling machine seems superior to other types from a standpoint of quality of pickled ware, cost of operation and versatility.

Immersion tubes, open pressure burner fired (EX)

By S. E. SHEPARD

Immersion heating may be defined as the heating of liquids from heat sources located within the body of the liquid. The outstanding advantages of such a method comprise low heat losses, high heat transfer from heat source to heating surfaces, high

heat transfer from heating surfaces to the bath and simple adaptability to a wide variety of applications.

Methods of heating by immersion fall into two classes, of which the first is combustion and the second non-combustion. In the combustion

group there are four members; namely, open pressure burner fired, enclosed pressure burner fired, open atmospheric burner fired and submerged pressure burner fired.

The open pressure burner classification has a preponderance of advan-

tages. This type is simple to install, easy to light, readily observed, stable in operation, and readily adaptable to automatic lighting, automatic controlling and automatic safety protection. It is efficient in operation and moderately priced.

Immersion heating of the non-combustion type may be classified as electric resistance, steam and liquid types. The first is most convenient but costly initially and in power consumption. Steam is often used and is very simple and inexpensive for immersion equipment and controls. The boiler poses the greatest problem and entails considerable expense and operational equipment. Since the steam condenses to produce a partial vacuum, a leaky immersion pipe may cause considerable boiler contamination before discovered. Furthermore, temperature differentials are low, causing slow heating and large tube areas to be required. Similar characteristics obtain for hot liquid systems but to a more pronounced degree.

Basic elements in a heat balance

To study the heat requirements and the correct application of burners, tube sizes and tube lengths, it may be well to proceed by first recalling the basic elements involved in a heat balance. The fuel input is dissipated through heat storage, heat losses and flue losses.

Heat storage involves merely that part necessary to heat the tank, tubes, liquid and work. It is obtained in B.T.U. per hour by multiplying the specific heat of each respective material by its temperature rise in degrees Fahrenheit. In the use of baths other than water, heat storage need

only differ in the use of the appropriate heat content of the liquid and in the tank, tube and work materials involved.

The heat storage for the work and its baskets, trays or conveyor fixtures, plus that lost in water removed with

out substantial error. Likewise, the radiation and convection losses from the water surface may be assumed with little error to be the same as those for a bare tank wall.

Evaporation losses are difficult to calculate due to the combined effects

Table No. 1
Heat Transfer to 60° F. Atmosphere from Tank Walls

HEAT LOSS TO ROOM—B.T.U. per Hr. per Sq. Ft. of WALL AREA				
Water Temp. ° F.	Bare Tank Walls	Insulated 1" Thick	Insulated 2" Thick	Insulated 3" Thick
90	50	12	6	4
100	70	15	8	6
110	90	19	10	7
120	110	23	12	9
130	135	27	14	10
140	160	31	17	12
150	180	34	18	13
160	210	38	21	15
170	235	42	23	16
180	260	46	25	17
190	290	50	27	19
200	320	53	29	20
210	350	57	31	22
220	380	61	33	23

For other room temperatures than 60° F. multiply the values given in table by the fraction:

$$\frac{(\text{Water Temperature } ^\circ \text{F.}) - (\text{Room Temperature } ^\circ \text{F.})}{60^\circ \text{F.}}$$

$$(\text{Water Temperature } ^\circ \text{F.}) - 60^\circ \text{F.}$$

the work, are the storage losses involved during production operation of the immersion tank. The storage of heat in the bath, tank and tubes only becomes of interest for initial bring-up time calculations.

General heat losses comprise those from tank walls, water surface and water spray when such is used. Losses due to radiation and convection from tank walls are listed in Table No. 1 according to the amount of insulation used or its absence. Although not strictly exact for the purpose, the values shown for tank walls are used for losses from tank bottoms with-

of surrounding atmosphere temperatures, surrounding relative humidity and atmospheric movement.

Evaporation losses from the water surface assume a rapidly increasing magnitude as the boiling point is approached.

The final group of losses to be accounted for are those of the flue gases. If we adjust the combustion to perfect fuel-air ratio, flue loss resolves itself into evaluating the flue temperature. This temperature is a function of immersion tube length, diameter and fuel input rate.

Fuel oils in porcelain enameling (EX)

By WILLIAM M. JONES

Fuel oil classification has been concisely standardized by the U. S. Dept. of Commerce into five grades known simply as No. 1, 2, 3, 5 and 6 fuel oil. Practically all refineries use this classification for any fuel oils they may produce.

An inspection of the characteristics of fuel oils from grades 1 to 6 shows that the classification has been consistent with the fuel oil properties in that, as the grade number increases, all properties increase in numerical value.

Grades 1, 2 and 3 are always distillate oils and range in color from a light yellow to a deep red. Grades 4 (not provided for in the general specifications) and 5 are either residual oils or a blend of residual and distillate oils. Grade 6 is practically

always a straight residual oil.

Sulphur

Apparently the only specification that has special significance to porcelain enameling is that of sulphur. Sulphur can be contained in the fuel oil in many different forms as organic sulphides and probably never as free sulphur. When the fuel oil is burned in a porcelain enameling furnace, all the sulphur is oxidized to sulphur dioxide. Since sulphur dioxide has a bad effect on porcelain enameled surfaces, it is necessary to procure fuel oils which stay within the necessary limits of sulphur content. The distillate oils (No. 3) allow up to 0.75% sulphur while the residue oils (5 & 6) have no limit. This does not mean that residual oils cannot be used because of sulphur, as there are many residual oils that have little or no sulphur. It is interesting to note that when a crude oil containing sulphur is fractionated or distilled all fractions will contain sulphur. The sulphur will be higher as the boiling point of the fraction increases and the residue will contain

is 100° F., while to obtain 500 S.U.S. the required temperature is 150° F.

A viscosity of 100 S.U.S. or less is needed to effect proper atomization of fuel oils with low pressure air atomization (1.0 to 2.0 P.S.I.).

Heating value

The third specification for discussion is heating value. This specification does not appear on the sheet of the U. S. Dept. of Commerce, probably because there is no way of controlling it. In general the heating value increases with increase of specific gravity. Table No. 1 lists the heating value of the six ordinary grades of fuel oil, both as B.T.U. per gallon and B.T.U. per pound.

The values given in Table No. 1 are called "gross heating value" and represent the quantity of heat obtained when a gallon or pound of oil at 60° F. is burned at constant volume and the products of combustion are cooled to 60° F. with the water vapor being condensed. The value as such cannot be used in calculations since the stated conditions are never met in practice. In practice,

combustion process.

Fuel oil systems are necessary in order to provide fuel oil to combustion equipment. The system can be simple or complex according to the equipment needed to produce a desired result. An understanding of a correctly designed simple system will allow one to expand to complex systems without undue difficulty.

The piping system itself will include a main line from the oil tank to the vicinity of the furnaces, plus the off-take lines to the furnaces. If the main line returns to the tank it is called "recirculating." If the main line stops at the last furnace it is called "dead ended." The "dead ended" main line is to be avoided due to operational difficulties. Any system when starting up will contain a large quantity of air and if the main line is "dead ended" the air can only be removed through the burners. In addition, pockets of air will be left at various places in the piping system that will gradually bleed out along with the oil, causing erratic combustion. If such a system were to attempt to utilize a residual oil, no end of trouble would be experienced in getting oil of proper temperature to the burners, both in starting up and during operation.

By using a "recirculating" main line, a large flow of oil can be maintained to remove all the air in the line before flowing oil to the burners. When using residual oils, the oil temperature can then be brought up to the proper operating level before being sent to the burners. The continuous flow of oil back to the tank also helps to prevent any tendency of sludge settling in the tank.

After all the necessary considerations are made, it will probably be found that in 90% of the cases a distillate oil will be required for porcelain enameling furnaces. This is because of sulphur limitations, the relatively small advantage of price of heavy oils, and the unquestionable convenience in handling. Even though there are heavy oils with low sulphur content there is still the danger of occasionally receiving a

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Table No. 1

Grade	1	2	3	4	5	6
B.T.U./gal.	133,000	135,000	138,000	143,000	150,000	153,000
B.T.U./lb.	19,800	19,900	19,800	19,300	18,600	18,500

a proportionately higher amount than the distillates.

Viscosity

The second specification in order of importance is viscosity.

A viscosity of 100 S.U.S. or less is needed to provide accurate controlled flow through orifice metering devices such as valves. This comes from the fact that temperature fluctuations of 10° F. will not seriously affect the flow at 100 S.U.S.

A viscosity of 3000 S.U.S. (300 Furol) or less is needed for pumping. As the viscosity is allowed to increase, a high pressure drop through the piping system will be required to effect the proper flow of oil. In order to utilize smaller piping, a viscosity of 500 S.U.S. is recommended. The temperature to obtain 3000 S.U.S. on a No. 6 oil

the fuel is burned at constant pressure (usually atmospheric), the flue gases have a temperature considerably above 60° F., and the water vapor is not condensed.

A better value is one obtained from the "gross heating value at constant pressure" (*which is somewhat smaller than at constant volume*) with the water vapor not condensed. This is called "Net Heating Value" and is then used with a combustion efficiency figure for the particular process or furnace in question. (*Net value is 5 to 10 per cent lower than gross.*)

Fuel oil systems and equipment

The engineering of piping systems and the proper use of the equipment for the control and combustion of fuel oil are important considerations in obtaining a successful com-

Porcelain Enamel Institute

sixteenth annual meeting

MEMBERS of the Porcelain Enamel Institute met at the Hotel Cleveland, Cleveland, Ohio, on October 9 and 10, for what was termed the most successful meeting held in recent years.

Thursday was set aside for the sixteenth annual meeting, and was taken up largely with the necessary Institute business. Following registration in the morning, there was a meeting of the executive committee and then individual divisional meetings.

The annual meeting was scheduled for 2:00 p.m., followed by a meeting of the new Board of Trustees, a "hospitality hour" at 4:30 p.m., and the annual banquet at 7:00 p.m.

Clawson new Institute president

Dudley Clawson, president of Ferro Enamel Corporation, heads the slate of new officers elected by the Board of Trustees.

Other newly elected officers include P. B. McBride, Porcelain Metals Corp., as treasurer, and three new vice presidents—E. L. Seasholtz, J. M. Seasholtz & Sons, Inc.; R. J. Ritchey, Carnegie-Illinois Steel Corp.; and J. T. Penton, California Metal Enameling Company.

Three new members on the Board of Trustees

Announcement was made of the election of three new members to the 25-man Porcelain Enamel Institute

Board of Trustees. New board members include: R. A. Weaver, Jr., Bettinger Enamel Corporation, representing the Sign Division; F. L. Meacham, Chicago Vitreous Enamel Product Co., representing the Frit



President Clawson

Division; and Dana Chase, publisher of *finish*, representing the Cooperating Division.

Committee activity reports and future plans

At the annual meeting, following a talk by President Turk on the theme "We Must Prepare for Selling," and the annual reports of the secretary and the treasurer, each of the active committees presented individual re-

ports to the membership. The following reports were included: Product Standards Committee, Dr. G. H. Spencer-Strong; Market Research Committee, Floyd Woleslagle; Forum Committee, F. E. Hodek, Jr. (presented by Edward Mackasek); Market Development Committee, R. A. Dadisman; and Institute Development Committee, P. B. McBride.

In his report, Mr. Woleslagle presented data resulting from four separate surveys which have been conducted by the Market Research Committee. These were: restaurant survey, grocery stores (*frozen food cabinets*), shopping survey (*American Home Magazine*), and vending machine manufacturers' survey.

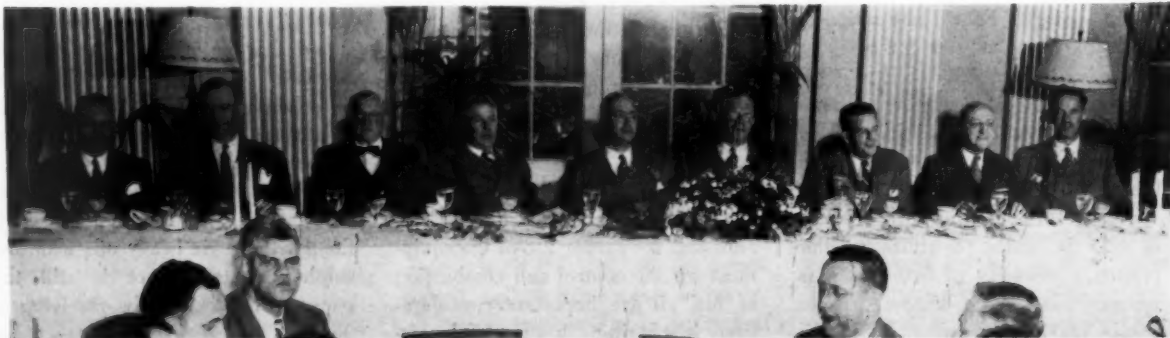
Mr. Dadisman detailed the activity of the Market Development Committee, including sales helps, advertising and publicity services. A complete outline of the 1948 plan was presented in booklet form to the membership.

In addition to the overall Institute activity in these fields, each of the active divisions will be represented by an individualized promotion program.

Retiring officers honored at annual banquet

At the annual banquet on Thursday evening, R. H. Turk, who served three very successful terms as Insti-

At the annual banquet speaker's table are, left to right: McBride, Ritchey, Guest Speaker Luke Barnett, Hogen-son, Turk, Clawson, Penton, Seasholtz and Spencer.



finishphoto

tute president during years that were filled with trying problems for all associations as well as their individual members, outlined the basic aims of the Association and was profuse in his thanks to the working committees which form a part of the Insti-

tute's organization. He also paid strong tribute to Edward Mackasek, secretary and managing director, for his work with the group.

Both Turk and William Hogenson, retiring treasurer, were lauded for their contributions to the growth and

success of the organization. "Bill" Hogenson retires after 17 years' continuous service as treasurer.

As a more literal manifestation of appreciation, both men were presented with suitable gifts by the membership.

and first sales and management conference

FRIDAY'S program, opening promptly at 9:00 a.m. and carrying through to 5:00 p.m., represented a program jam-packed with ideas for selling porcelain enameled products of all types. F. L. Meacham, chairman of the Sales and Management Conference, presided. In addition to the Institute membership, sales and management representatives from many of the leading finished product producing companies were present.

The opening gun of the program was an inspirational talk by A. M. Sweeney, manager of sales, appliances, General Electric Company, whose subject was "Sales Begin with a Finish." Mr. Sweeney's long experience in appliance sales, combined with his intimate knowledge of the porcelain enameling industry, contributed to a most interesting and helpful message.

Practical demonstration shown

Under the program title "Dramatizing Porcelain Enamel Through Demonstration," Dana Chase, publisher of *finish*, presented a series of units suitable for use in displays or exhibits and mechanical demonstrations which have been used effectively by

various companies throughout the industry.

Outstanding contributions to the mechanical demonstrations were those of A. O. Smith Corporation and Frigidaire Division of General Motors Corporation. A practical table

unrolling of a long sheet of porcelain enameled "wallpaper" (light gauge steel, enameled white on both sides), which effectively demonstrated the flexibility of modern porcelain enameled metal.

The architect's viewpoint

With many leaders in the enameling industry looking to architectural porcelain as the greatest potential field for expansion, architect Roger Allen's subject, "Selling Porcelain Enamel to the Architect," merited close attention. In Mr. Allen's opinion, three of the most important points in approaching an architect with a building material are its ability to meet requirements of plasticity, performance, and price.

Plasticity, as referred to by the speaker, means "the ability to retain a shape obtained by pressure deformation." The ability of porcelain enamel to be bent, curved, or corrugated is of great importance in connection with its sale as an architectural material.

As the cost of both labor and material continues to rise for the conventional building materials of small unit measurement, such as brick,

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New PEI Officers

President: C. D. Clawson, Ferro Enamel Corporation

Vice Presidents:

Herbert R. Spencer, Erie Enameling Company

E. L. Seasholtz, J. M. Seasholtz & Sons, Inc.

J. H. E. McMillan, Ingram-Richardson Mfg. Co.

R. J. Ritchey, Carnegie-Illinois Steel Corp.

J. T. Penton, California Metal Enameling Co.

Treasurer: P. B. McBride, Porcelain Metals Corp.

Secretary: Edward Mackasek, Porcelain Enamel Institute

top demonstration, employing a model (see September, 1947, *finish*, page 53), was the idea of the Douglas Furniture Corporation, Chicago.

Dramatic closing for this series of demonstrations was provided by the

Left: Treasurer McBride is serenaded by banquet entertainers. Center: New Vice President Ritchey prepares for work. Right: Two other new vice presidents, Penton and Seasholtz, discuss industry prospects.



finishphotos

Chicago enamellers fall meeting

MEMBERS of the Chicago District Enamellers Club opened their fall season with a luncheon meeting, October 4, at the Graemere Hotel.

Following the handling of club business, Wayne Deringer, A. O. Smith Corporation, president of the club, introduced Elmer Dany, of Ferro Enamel Corporation, and Dr. W. J. Humber, of Rohrer, Hibler & Replogle, as guest speakers.

Pointers on furnace care

Dany reviewed the history of enameling furnaces, and presented a general survey of the enameling industry. Since VJ-Day, Dany stated, more than \$10,000,000 worth of new enameling equipment has been added to the industry. Commenting on the future of porcelain enamel in the housing industry, he said that he had worked for awhile on one housing

project of such scope that it called for the use of 42 continuous furnaces larger than any ever built. These furnaces had to be large enough to fire pieces 4' x 10' and with flanges on four sides. The present steel shortage shelved the project. Dany also said that current frit production was not near high enough to meet the needs contemplated in this venture into the housing industry.

Dany presented a number of suggestions for increasing the efficiency of enameling furnaces. His suggestions called for the immediate cleaning out of any ware that had fallen in the hot zone of the hearth, and also the cleaning of the zone after each shift. Gas and oil burners should also be cleaned regularly. The location of the blower fan supplying primary air for combustion should not be too near a spray booth or a brushing station, said Dany, adding that

there should also be a filter on the intake of the blower. Other suggestions included the cleaning of shoe plates, and the use of an optical pyrometer for checking temperatures in the firing zone. Another proposal was that each plant turn its "Rube Goldberg" loose, and let him work on efficiency plans.

Speaking of industrial progress, he said that before the war the gross weight per hour of a continuous furnace was around 14,000 to 15,000 lbs per hour. Since the war one company has brought that capacity up to 34,000 lbs per hour. "That's progress," stated Dany.

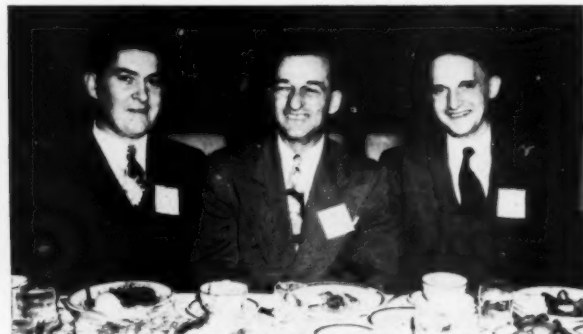
He concluded his discourse by pointing out that the average furnace interior should last from two to three years if properly heated and cooled. A used furnace should not be brought up to 1600° F. in less than five days,

to Page 56 →



Above: Left — Wayne Deringer, of A. O. Smith, club president, is flanked by featured speakers, Elmer Dany, of Ferro Enamel, and Dr. W. J. Humber, of Rohrer, Hibler & Replogle; Right — William Asselin, of O. Hommel, with Joe Thornton, of Kalamazoo Stove, and Prince Hayles, of Ingersoll Steel. Below: Left — Ferro's Lou Hart, from West Coast club, with Herman Cook, of Ingersoll Steel, and Ed Sharf, of Hotpoint; Right — Carl Forster, Dan Kluck and John Rogowski, all of Geuder, Paeschke & Frey.

finishphotos





CENTRAL DISTRICT CLUB CLAMBAKE

finishfotos

Top row: Left to right, Paul Cecil, Strong Mfg. Co., club vice president; John Lannon, Westinghouse, club vice president, "shakes" with Harry Dowds, Mullins Mfg.; Jim LeMunyon, Tappan Stove.

Second row: A couple of prize winners, left, Dan Butler, Mullins' Salem plant, and, right, Bob Lowden, McGean Chemical.

Third row: Two more lucky club members, left, R. E. Taylor, Enamel Products, and right, Bill Wenning, Ceramic Color.

Bottom: Club members assemble after a hearty repast of clams, sweet corn and chicken.



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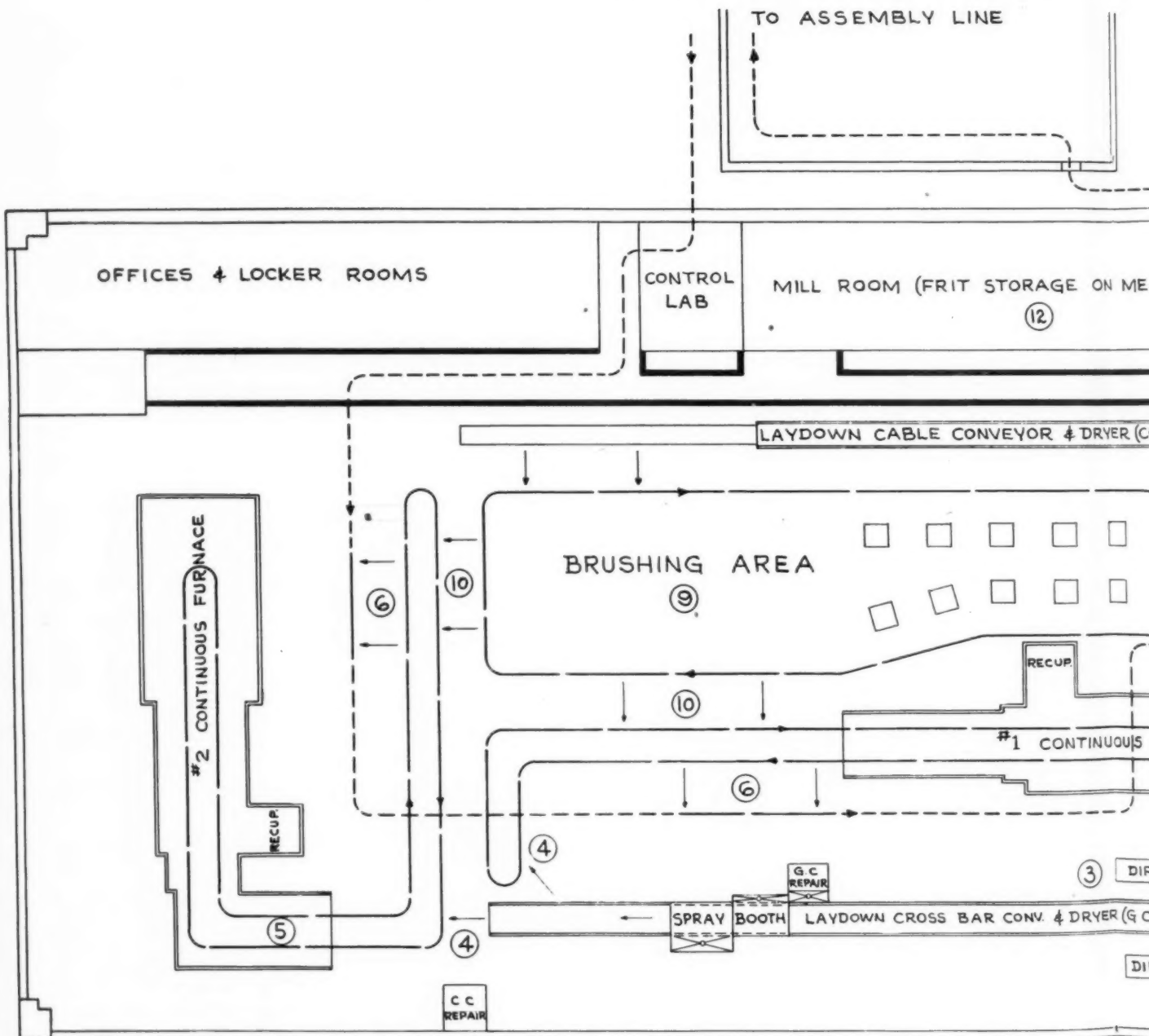
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(Education and research)

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C. M. Dodd, Professor, Head of the
Department of Ceramic Engineering

Plant Layout No. 9

A two continuous furnace porcelain enameling p



(Plant description st

1. Black shape storage is placed immediately adjacent to the pickle room, an ideal location.

2. The pickle room consists of a 9-tank setup (including dryer) and represents an open tank type, manually operated installation,

3. Ground coat is dipped simultaneously from two tanks paralleling the dryer feed conveyor.

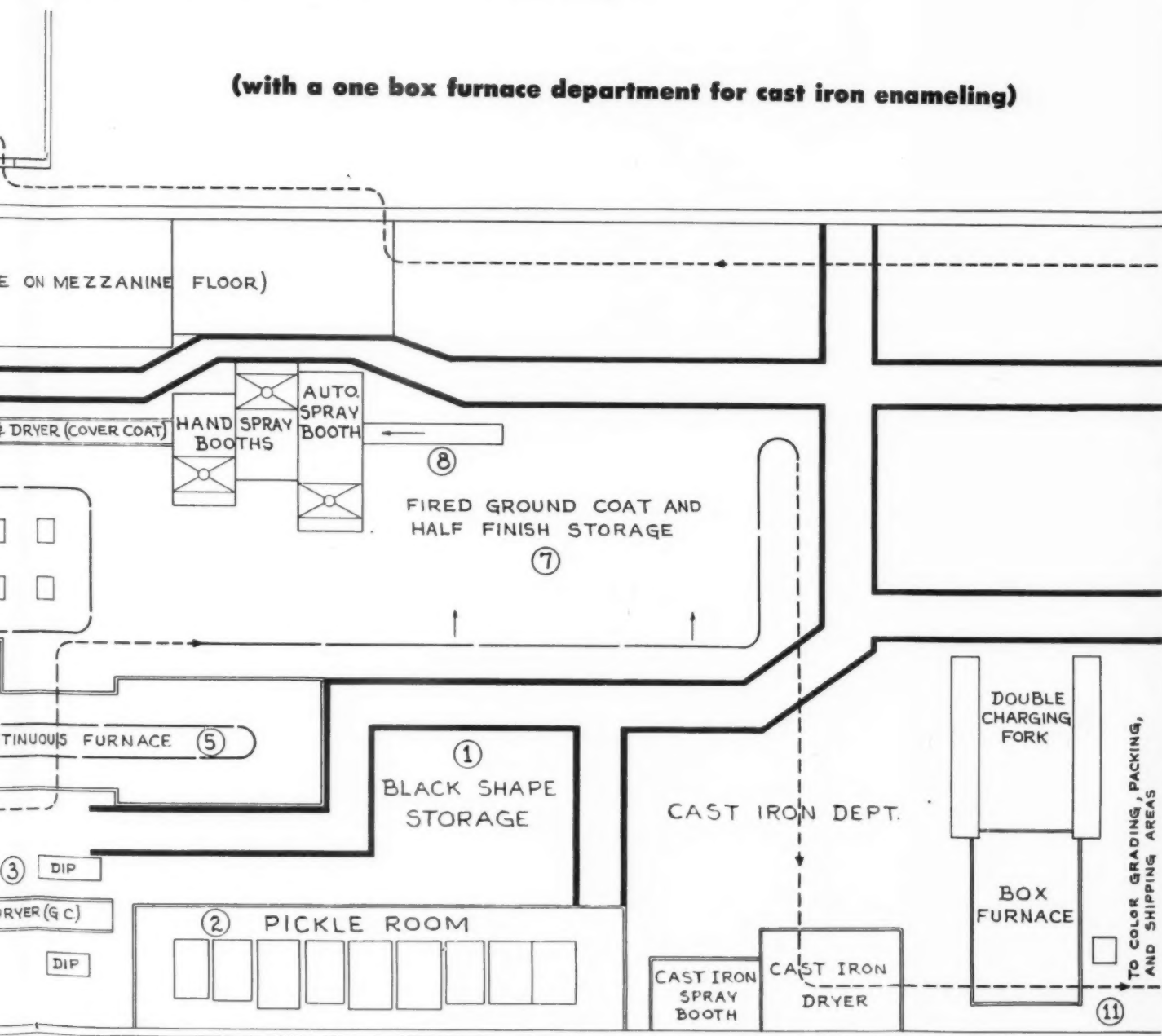
4. Dried ground coated parts may be transferred with equal convenience to the furnace chain of either Furnace No. 1 or Furnace No. 2.

5. Due to limited plant width and location of Furnace No. 1, Furnace No. 2 was designed with a short "L."

6. Transfer points for fired ware from furnace conveyors to overhead monorail service conveyor. On-the-line inspection is handled here.

eling plant for stove work and jobbing

(with a one box furnace department for cast iron enameling)



tion starts on page 15)

7. Fired ground coat is stored between take-off point from shop conveyor and finish coat spray line.

8. Loading point for automatic spray. This conveyor runs at speed of 34' per minute by using manual spray as covercoat overspray.

9. All brushing and screen process decoration is handled within the brushing area conveyor loop.

10. Transfer points for cover coat to either furnace chain for cover coat firing. Notice proximity of conveyors at all transfer points.

11. Service conveyor transports finished ware through second floor color grading room and OK'd ware on to shipping and assembly areas.

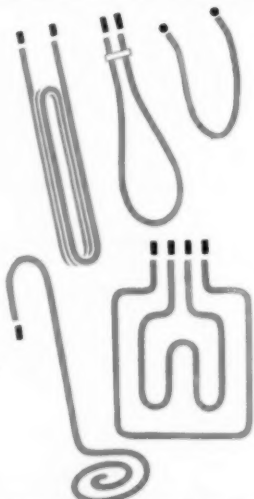
12. Mill room houses six mills ranging in capacity from 300 to 2,000 lb., all equipped for overhead loading.



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The Washington round-up

By Wilfrid Redmond

STEEL executives, called to Washington by the Senate Small Business Committee on Steel to reply to the demands of small manufacturers, the Government, and labor for greatly increased steel capacity, told the committee that the kind of expansion advocated by these witnesses was unrealistic and would result in a greater inflation than we have now.

The steel leaders pointed out that huge postwar expansion and improvement programs of the industry, involving record-breaking peacetime expenditures totaling more than \$1 billion have been under way since the end of the war.

Benjamin Fairless, president of U. S. Steel, asked by Senator Martin, of Pennsylvania, chairman of the Sub-Committee, for an estimate of when the industry will be able to meet all consumption requirements, said that domestic demands will be met in two years or less, if raw materials and labor remain available.

Eugene Grace of Bethlehem Steel Corporation told the committee that the job can be done in two years both as to domestic demand and normal export requirements, if materials and manpower are in supply at the required levels.

"It is true," Fairless told the Committee, "that the supply of steel is temporarily less than the present demand, but the great pipelines of steel inventories in the many businesses of the country are gradually being filled. Present day demands are extraordinary, as might be expected, following a long war. Government sponsored programs such as a veterans' housing and the emergency freight car program have also involved unusual steel requirements. The steel industry now faces a new program aimed at rehabilitation of the coal and steel industries in the Ruhr."

Facilities for completion in 1947

Admiral Moreel, of Jones & Laughlin, speaking for the steel executives at the conference, said that facilities

listed for completion in 1947 include the addition of 2,500,000 tons of ingot making capacity. Also under construction are nearly 3,000,000 tons of new coke oven facilities, 3,000,000 tons of new blast furnace capacity, and 3,000,000 tons of new sheet and strip capacity.

Current ingot capacity is 85,000,000 tons

The industry is currently running at an annual rate of 85,000,000 tons of ingot making capacity, the highest for any peacetime year in history, Moreel pointed out.

Tom Girdler, chairman of Republic Steel, drew a picture of what would happen if the industry undertook any substantial increase in expansion, such as 30 million tons, as advocated by the CIO.

Such an increase could not be obtained by improving existing facilities, he said. It would require the construction of new plants, finishing mills, the opening of new mines, and would take two years before a ton of steel could be produced. By that time, he said, the present emergency demands would have been met. Such an expansion would consume our ore reserves faster than we could open new mines, Girdler told the Committee.

The steel industry even now has a labor deficit, Girdler said. Unrealistic expansion plans, such as proposed by witnesses before the Committee, would present a problem in raising the required labor force. We might have to import workers, and if we did, what would we do with them when the demand has passed. It would be better for Americans to get along with a few less cars, refrigerators, and stoves now, and not have unemployment five years from now, Girdler said. The peak demand is even now passed and a gradual decline is indicated.

The steel leaders all offered testimony to show that they are taking care of small businesses as well as

large customers.

"As to taking care of the small fellow," said Eugene Grace of Bethlehem, "in the second quarter of this year, Bethlehem shipped 40 per cent of its tonnage to customers in the small business category. Out of the 8,000 customers receiving shipments from us in that quarter, 6900 were small businesses, as defined by this committee."

Shortages of coal and scrap are keeping production down, the steel producers told the Committee. Grace vigorously attacked the policy of shipping coal abroad when the steel industry is short at home. He said that something should have been done long ago about getting German coal and steel capacity going. We cannot, he said, build steel capacity here to supply Europe.

Senator Wherry of Nebraska, chairman of the Senate Small Business Committee, recently pointed out that total exports of finished steel in 1946 were 5,137,747 tons, as compared with total production of 48,775,522 tons. In 1947, finished steel products are being exported at the rate of 6,500,000 tons for the year, against an estimated production of 65,000,000 tons.

"The shortages of critical steel items in this country have made it impossible for many American businessmen to plan production on a sound basis, if such production depends upon the use of any steel item," Wherry told a closed session of the committee. "There is a very serious possibility that homes will be cold and businesses forced to operate at reduced levels this winter because of the shortage of steel pipe with which to transport heating oil and gas."

Special session of Congress?

A special session of Congress is now expected about November 15 to December 1. Congressional committees on appropriations and foreign relations are meeting in November to study the relief program which the Administration has outlined for the nations of Western Europe. The call of the Committees was issued by the President after a meeting with Congressional leaders. It was decided at

this conference to try to keep France and Italy going on a starvation basis with the aid of executive funds, but the only money in sight is a residual amount from UNRRA, and it is only enough to carry the program until December. Either Congress meets and votes an appropriation for December and possibly January or funds not now in view will have to be produced. The President said that \$580,000,000 would be required to carry the aid program through March 31. This is in addition to any money that may be found in executive appropriations already made.

It is thought likely that if Congress meets to consider a stop-gap program it will also start work on the Marshall plan. Secretary of State Marshall says they are two parts of an integrated program.

Senator Taft recently remarked that some bright boy in the Government should be able to find sufficient funds to aid Europe until Congress meets in regular session in January. The Senate Majority Leader said that he would not be ready to think about a special session until after December 15. Any special session called after that date would allow very little time for debate and the foreign relief program is an issue that most Congressmen will want to make at least one speech about.

If France and Italy go over to Communism this winter, which is foreseen if fuel and food is not made available by the U. S., Congress will not have to consider the Marshall Plan, top officials of the Administration state quite candidly. They add, if the Iron Curtain moves to the Atlantic wall, we can start getting ready for war.

There are millions of Americans, it is realized, who do not share this view. There is Congressman John Taber, for instance, who returned from Europe recently with the report that he found no food shortage in France and Italy.

Rationing and price control

Rationing and price control will not be considered in connection with the interim relief program. The emergency would be over before such ac-

tion could be taken. That is the reason the Administration has asked for a voluntary food conservation program.

But controls will be discussed when the Marshall plan comes before Congress in the regular session. Republican leaders, holding price hearings sponsored by the Joint Committee On the Economic Report, have stated that even price control may be considered.

The Marshall Plan covers four years of assistance to the 16 participating nations from 1948 through 1951. The U. S. will be asked to provide 2.8 million tons of steel in 1948, the same in 1949, 2.9 million tons in 1950, and 2.8 million tons in 1951. These are the estimates recently made in the general report of the Committee of European Economic Cooperation. In addition, the U. S. will be asked to provide \$100 million in import requirements for equipment for the iron and steel modernization of the 16 nations. It will include the

construction of such vital items as continuous wide strip mills.

Steel exports represent only a part of the requirements of the 16 nations for steel. All types of machinery manufactured from U. S. steel will be shipped to the participating countries. Requirements of farm machinery alone in 1948 are estimated at \$370 million. The program will require \$168 million of freight cars in 1948. The production capacity in freight cars of the participating nations for 1948-51 is estimated at 621,000. The requirements are 724,000, or over 100,000 freight cars from the U. S.

These figures give some idea of the magnitude of the drain upon U. S. steel production. There are many other steel using items, such as saw-mills, tankers, passenger cars, electrical equipment. The estimates point to lengthy debate in Congress on distribution controls affecting many materials and commodities.



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→ from Page 25

high sulphur oil. The price advantage of heavy oils over distillates is so small at the present time that it is hardly worth considering. In standby systems and systems with small burners requiring accurate control, the handling of distillate oils is much easier than with residual

oils since no preheating is required and the oil system is always ready to take over in case of gas shutoff.

One other point should be emphasized and that is that when a dual fuel or oil standby system is installed, it should be operated immediately to make sure that it is in operating order and not wait until the system

is actually needed. Oil combustion is somewhat more difficult to control than gas, but if the system is thoroughly checked and the operators become familiar with the equipment there is no need for any great difficulty in changing over from gas to oil combustion.

Use of propane and butane at enameling plants (EX)

By E. A. JAMISON

For all practical purposes LP-Gas can be compared to manufactured gas on a direct B.T.U. basis, although actually you should obtain from 3 to 5 per cent greater thermal efficiency with the former due to the total absence of inerts and, consequently, its higher available heat and generally greater flame temperature. It can be compared to natural gas generally on a direct B.T.U. basis, unless the natural gas contains a high percentage of inerts. Comparing it to producer gas, however, it is a different story since the latter has a very high percentage of inerts and, therefore, less available heat and lower flame temperature. For instance, at an operating temperature of 2000° F. the available heat of propane is approximately 49 per cent of its gross B.T.U. value, which compares to 32 per cent for producer gas. When considering this and the difference in flame temperature, you can conservatively figure the LP-Gas will be at least 20 per cent greater in thermal efficiency than producer gas. The greatest advantages of LP-Gas over manufactured gas and producer gas are its cleanliness, almost total lack of any form of sulphur, and its flexibility—that is, practically any amount you want is available at any time merely by the turning of a valve handle.

Generally speaking, when comparing LP-Gas to fuel oil, it has been our experience that the former has been installed to speed up production, obtain a better quality of finished product, improve working conditions, or a combination of all of these.

On high temperature operations—say 2000° F. and above—where there

can be nothing gained through obtaining better heat distribution by more accurate temperature and atmosphere control, cutting down the combustion space, or doing away with a muffle, then a conversion to LP-Gas may not be justified. Also, the oil has the advantage at these temperatures due to the luminosity of the flame which gives off considerable radiant heat. In such cases, fuel oil and LP-Gas may be compared on an almost direct B.T.U. basis with perhaps a 5 to 10 per cent less B.T.U. consumption with the LP-Gas due to better proportioning with the air for combustion. For temperatures in the normal heat-treating and porcelain enamel burning ranges, LP-Gas should generally be compared on a gallon for gallon basis with fuel oil if no changes in furnace or oven construction are made.

Consider size of installation

LP-Gases are not common commodities like coal, fuel oil and gasoline. The volumes produced are small in comparison. The two hundred pound working pressure tank cars cost approximately four times that of an ordinary oil car; therefore, LP-Gas tank cars and transports have to be used with greater efficiency. The amount of LP-Gas most producers or marketers will ship you per month is tied in with the amount of storage you have and this is made a part of the contract. Storage for plants operating 12 months of the year on LP-Gas is usually considered adequate if it has a capacity equal to ten days to two weeks reserve when able to unload an additional car. If the LP-Gas is to be used as a standby

to another fuel, then it is much safer to install sufficient storage to tide your plant over the entire possible shut-down or curtailment period since the LP-Gas industry has a peak demand in the winter the same as the manufactured and natural gas industries.

Storage tanks of 18,000 and 30,000 gallon gross capacity are normally used. The 30,000 gallon size is the largest approved by the National Fire Protection Association. A complete installation will ordinarily cost from 40¢ to 50¢ per gallon of installed gross storage capacity, depending mainly on whether an undiluted or diluted plant is required and whether it must be low pressure or high pressure.

Combustion systems and burner equipment

If manufactured or natural gas is used at high pressure—manufactured gas at usually 10 psi and natural at 20-30 psi—through high pressure injectors, then it is necessary to either increase the size or number of injectors when converting to high pressure propane if the same B.T.U. input is required. This is because it requires about 25 parts of air for complete combustion with propane as compared to 5 parts for manufactured gas and 10 parts for natural gas. Or the propane may be diluted with air to make a replacement gas (*its B.T.U. value depending on the B.T.U. value and specific gravity of the gas being replaced*). This gas-air mixture is then compressed to the same pressure as the former gas. There is also diluting equipment available which proportions the already high pressure propane vapor



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● You'd know their performance record. You'd realize that the best in the business had given them a thorough test, and that they had met his exacting requirements before they were ever offered for sale.

The same is true of PORCELFRIT. It's not just something dreamed up by a bunch of smart chemists . . . it's been in actual hard use right here in our own job enameling plant. The "bugs" have been worked out before we put it on the market. What's more, as new problems arise we revise PORCELFRIT to meet them. That's what we mean by *plant testing* . . . and that's why we say you're doubly protected—through laboratory tests and the demands of daily use. Avoid enameling trouble with *plant tested* PORCELFRIT.

INGRAM-RICHARDSON MFG. CO., OF INDIANA, INC.

OFFICES, LABORATORY AND
PLANT, FRANKFORT, INDIANA



with compressed air, thus making it possible to use a smaller compressor.

If the LP-Gas is to be used in a low pressure, one valve control system, then you should have a more accurate adjustment on the gas at the outlet of the zero governor. Individual adjustments to compensate for the difference in B.T.U. are, of course, required when changing over from manufactured or natural gas unless a low pressure central mixing gas-air system is installed.

On two valve control systems, it is best to change to smaller gas valves because of the difficulty of controlling the high B.T.U. gas. If an LP-Gas standby system is re-

quired, it is usually much more simple to install a diluter and blower for low pressure gas, and diluter and compressor—or compressor and high pressure proportioning valve—for high pressure gas; then all adjustments can be made at the diluter or proportioning valve. This is the method used when manufactured or natural gas and LP-Gases are used interchangeably.

Ordinarily to replace manufactured gas of 530 B.T.U., approximately a 700 to 750 B.T.U. propane-air is used; to replace 1000 B.T.U. natural, approximately a 1300 B.T.U. propane-air mix is used. This increase in B.T.U. is necessary in order

to obtain the same B.T.U. input per orifice since the specific gravity of the propane-air is greater. These values consequently depend on the gravity of the gas being replaced.

With any of the combustion systems mentioned, if manufactured gas is being replaced, or if LP-Gas is to substitute for it, then the same burner nozzle changes would be necessary as for a change to natural gas. That is, the rate of flame propagation of manufactured gas is considerably greater than that of natural or LP-Gas; therefore, to burn the latter gases it may require longer burner tunnels or flame retention type burner nozzles.

Job evaluation and wage incentives (AR)

By JOSEPH M. SCHAPPERT

Broader markets, improved selling, finishes and production processes are important concerns of progressive management. What to pay the men and women who turn out the goods is equally important.

Job evaluation

As a general rule, jobs in a plant may run the gamut from unskilled to semi-skilled or highly skilled. A plant usually has a range of job classifications, narrow or wide, depending upon the scope of its operations. It is to be expected that pay rates will differ because of the differences in kinds of work required. Do you know what these differences are so as to set up an equitable wage scale? Job rating can tell you.

Job evaluation and job rating are often confused. Job rating is the systematic process by which jobs are factually analyzed and placed in the order of their relative importance as a basis for establishing and maintaining sound wage and salary administration. It is one part of job evaluation—management's part. Its facts are stated in terms of definite factors and minimum requirements. Only management can say what the minimum requirements should be. The function of placing money values on the findings of job rating is a subsequent step. This step, together with the basic job rating, may be regarded

technically as job evaluation.

"Over three out of four gainfully employed persons in the United States are employees, and over three-fifths of the total income received by individuals consist of wages and salaries."*

Job and salary rating provide sound foundations on which to set up equitable wages and salaries. And, the processes by which wages and salaries are determined are vital to our whole economy.

The National Metal Trades Associ-

* Sumner H. Slichter, "Basic Criteria Used in Wage Negotiations," The Chicago Association of Commerce and Industry, 1947.

ation, which embraces in its membership a wider range of industries than its name would imply, has made available to its members two plans which are well and favorably known in the field of job evaluation. The NMTA Job Rating Plan is used in the measurement of jobs usually paid on a wage basis, and the NMTA Salary Rating Plan is used for the measurement of positions usually paid on a salary basis. Each plan is completely detailed in a separate manual, one for each plan.

Some of the benefits of job rating

to Page 53 →

Points Assigned to Factors

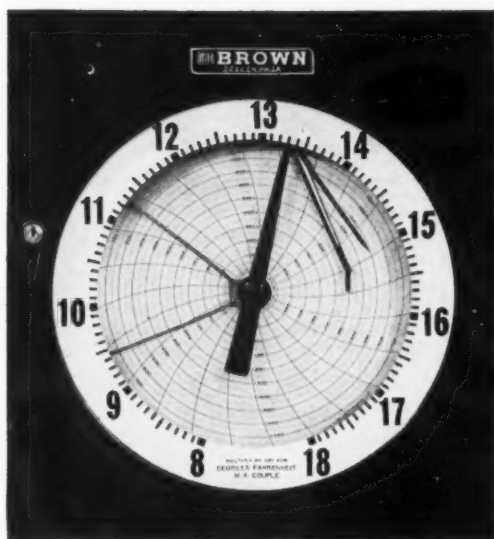
	1st Degree	2nd Degree	3rd Degree	4th Degree	5th Degree
<i>Skill</i>					
1. Education	14	28	42	56	70
2. Experience	22	44	66	88	110
3. Initiative and Ingenuity	14	28	42	56	70
<i>Effort</i>					
4. Physical Demand	10	20	30	40	50
5. Mental or Visual Demand.....	5	10	15	20	25
<i>Responsibility</i>					
6. Equipment or Process	5	10	15	20	25
7. Material or Product	5	10	15	20	25
8. Safety of Others	5	10	15	20	25
9. Work of Others	5	10	15	20	25
<i>Job Conditions</i>					
10. Working Conditions	10	20	30	40	50
11. Unavoidable Hazards	5	10	15	20	25
<i>From National Metal Trades Association Job Rating Plan</i>					
<i>Note: Specific definitions of each degree of each factor are contained in the NMTA Job Rating Manual available to NMTA members.</i>					

Electronik

+

Electric Control with

PROVEN PERFORMANCE



For six years, the Brown Electronik Potentiometer has proven superior in every measure of performance. Thousands of users acclaimed it as an Indicator, Recorder and Air-Operated Controller—NOW it is equally established as an electric controller.

The wide variety of models provides fourteen different switching actions for operation of electric control devices ranging from simple solenoids to complex input controllers. The control point is easily set by a knob on the front of the instrument.

Positive mercury switch control plus the Brown "Continuous Balance" System with its inherently greater accuracy and speed of response—offers to electric control users a degree of precision never before possible.

THE BROWN INSTRUMENT COMPANY,
4411 WAYNE AVE., PHILADELPHIA 44, PA.
DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR CO.

SUBSIDIARY COMPANIES IN TORONTO • MEXICO CITY • LONDON
STOCKHOLM • AMSTERDAM • BRUSSELS



This instrument is completely described in the new Brown Catalog No. 15-9. We will be glad to send you a copy upon request.

Glass-enclosed mercury Con-Tac-Tor Switches—



assure perfect contacts every time—free from the effects of dirt, dust and corrosive atmospheres.

Direct operation—



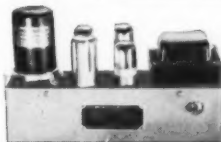
switches are directly connected to the balancing motor at all times. It is impossible for these units to get out of phase with each other.

Completely enclosed slidewire—



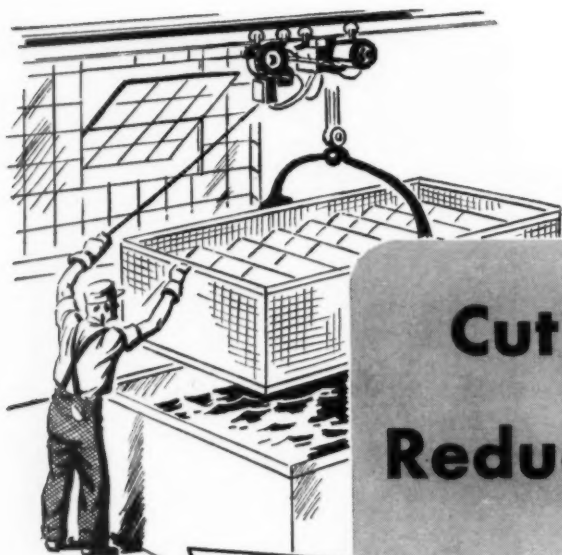
sealed against dust and atmospheric conditions—spiral winding permits longer length—1600 convolutions.

Brown "Continuous Balance" System—



eliminates galvanometer—provides greater accuracy, sensitivity, speed of response and thus closer control.

BROWN Electronik POTENTIOMETERS



Cut Cleaning Time
and
Reduce Cleaning Costs
with

Cowles
SOAKLEEN
Liquid Emulsion Cleaner



COWLES TECHNICAL SERVICE
gladly furnished upon request.

Cowles SOAKLEEN does a real job of removing stubborn soil and oils from metal parts in pre-soak cleaning. All following cleaning operations are reduced to a minimum.

SOAKLEEN works unusually well for cleaning steel before enameling, plating and other finishes.

SOAKLEEN is simple and easy to use, is non-toxic, cuts cleaning time and reduces cleaning costs. Place a trial order today—orders shipped promptly from convenient warehouse stocks.

Package—55 gal. non-returnable steel drums.

The Cowles Detergent Company

METAL CLEANER DEPARTMENT

7016 EUCLID AVENUE

CLEVELAND 3, OHIO

NEWS

V. A. Barlow's Pottery Enamel Company' announces the addition of Charles H. Goble to the organization. Mr. Goble (left) is in charge of the

Each set is equipped with a rubber tub-glass filter, a NBS Gasholder G229, and in a potometer, hinged-to box.

Hoffman's studio for hand painting

At the general review of the new "Edwards" factory in Cincinnati, the new building is 100 feet long by 110 feet wide. According to early reports, the new building is equipped with air conditioning.

made executive vice president and treasurer. He was also a director of the company.

Electric sign design competition

The closing date for entries in the second annual Electric Sign Design Competition is December 1. The contest is sponsored by the National Electric Sign Association.

Ten cash prizes, totalling \$1,000, are to be awarded to individuals submitting the best electric sign treatment for the corner drug store shown in the photograph in the rules of the contest. In addition, a Steuben Glass trophy will be awarded to the sign company whose employee receives the highest prize.

Awards will be made during the annual NESA convention in Chicago, January 19, 20 and 21, at which time the designs entered in the competition will be put on display.

Write to the National Electric Sign Association, 224 So. Michigan Ave., Chicago, Ill., for a copy of the rules.

Northern Ohio ACS meetings

The next meeting of the Northern Ohio Section of the American Ceramic Society is scheduled for November 6. The program committee has promised a worthwhile evening for which careful plans have been made.

The last meeting was a joint get-together of the Northern Ohio Section and Canton District Ceramic Engineers Club at the Aurora Country Club, September 19. John D. Sullivan, national ACS president, and E. M. Rupp, chairman of the local sections committee, attended the "gala affair."

Rutenber Electric expands enameling plant

Rutenber Electric Company, Marion, Indiana, is installing a new addition to its present enameling plant to house a combination gas and oil-fired continuous furnace and other major improvements such as a new pickling room, new mill room, cable type cover coat unit with gas-fired dryer and automatic spraying unit installed in pressurized room with filtered air input system. Five hundred feet of shop conveyor, equipped with shelf racks, will be added.

Perfection names new home economist

Perfection Stove Company announces the appointment of Mrs. Arlyne Hoffman as home economist. She will supervise the kitchen-testing of ranges, cookstoves and ovens in

the company's modern kitchen, which is a part of the firm's million-dollar research center.

A graduate of Western Reserve University with a B. S. degree in dietetics, Mrs. Hoffman is a member of the American Home Economics Association and of Phi Upsilon Omicron, national honorary home economics sorority.

Roper executive dies



Floyd K. Lawson, executive vice president and treasurer of the Geo. D. Roper Corporation, Rockford, Ill., died recently at West Yellowstone, Montana, while on a western trip.

He was born in Rockford, March 3, 1899. His business career was started in the billing department of the Roper organization in 1917. Later he was transferred to the sales department, advancing to director of sales. In 1942 he was made secretary and treasurer, and shortly thereafter was

National materials handling 1947 exposition in Cleveland

The National Materials Handling Exposition will be conducted for the second year in the Public Auditorium, Cleveland, Ohio, January 12-16, according to an announcement by Edwin J. Heimer, president of Barrett-Cravens Co., Chicago, and chairman of the exposition committee.

Educational features of the five-day show will include a conference on materials handling; a materials handling theater, which will present films on handling subjects, and an institutional presentation of materials handling equipment and systems in addition to those shown in commercial exhibits.

Warren Company installing new plant

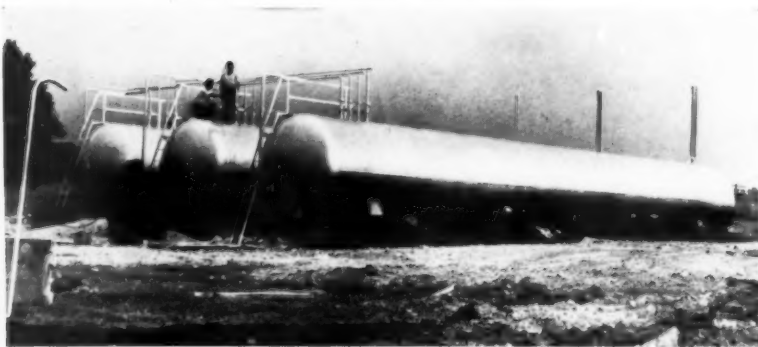
It is reported by Merse M. Murphy Company, porcelain enameling plant designers, that the Warren Company, Atlanta, Georgia, is installing what is expected to be one of the most modern enameling plants in the South.

A wooden building has been replaced by a much larger structure of brick and steel, with trusses 23 ft. from the floor and 15 ft. monitors above the trusses provided with ample ventilating exhausts.

Among the items of new equipment are: a large straight away continuous furnace—combination gas and oil-fired, 1400 ft. of transporta-

tion conveyor running from the furnace chain to the various assembly departments, a new up-to-date pickling room with filter presses and exhaust system, two lay-down cable type conveyors feeding gas-fired dryers equipped with automatic spraying machines and new spray booths, complete new air supply line with filters, and exhaust brushing tables.

Mullins announces million dollar expansion plan



These three huge tanks are insurance that Mullins' production will not be halted this winter when the natural gas supply is curtailed. The tanks hold 75,000 gallons of liquid propane gas, and the apparatus is capable of producing 40,000 cubic feet of vaporized gas per hour.

Nearly one million dollars is being spent this year by Mullins Manufacturing Corporation on its plants in Salem and Warren, Ohio, to increase and improve facilities for making kitchen equipment, according to George E. Whitlock, president.

Work at the Warren plant includes a new enameling furnace, propane gas equipment to supplement the reg-

ular gas supply, several new presses, and two new paint spraying booths housed in an addition to the plant.

The Salem plant is being modernized and new equipment, including spray booths and drying ovens, is being installed. New and spacious quarters for a research and development laboratory were completed recently in Salem.

Seven thousand attend second annual instrument conference and exhibit

The Second Annual Conference and Exhibit, held at the Stevens Hotel, Chicago, the week of September 8, was attended by more than 7000 instrument engineers, production executives, chemists and instrument men.

Instruments and control devices shown by 135 companies and four governmental agencies in 147 booths represented a value of \$6,000,000. The display space was 12,919 sq. ft.

The technical program was sponsored jointly by the Instrument So-

ciety of America and the Industrial Instruments and Regulators Division of the American Society of Mechanical Engineers. The next annual meeting of the Society will be in Philadelphia, September 13-17, 1948.

Ferro opens new Tennessee plant

Ferro Enamel Corporation has announced the opening of a new plant in Nashville, Tenn. The plant is said to be highly mechanized and equipped with the latest devices for laboratory and production control. The plant is turning out porcelain enamel frit at a rate of 8,000,000

pounds a year, and by adding an additional smelter, production will be stepped up to 12,000,000 pounds a year, according to a company report.

Schreiner advanced by U.S. Steel

G. Reed Schreiner has been appointed director of advertising, United States Steel Corporation of Delaware, succeeding Charles R. Moffatt who retired September 30, according to an announcement by David F. Austin, vice president of sales.

Schreiner is a director of the Pittsburgh Advertising Club and a member of the Industrial Advertising Council of Pittsburgh, chapter of the National Industrial Advertising Association.

Shortage of technical manpower to continue into 1949

Companies are short of technically trained men today, and competition for these men is keener than it ever was, according to H. N. Muller, manager of the educational department, Westinghouse Electric Corporation. Engineering colleges report a 100 per cent increase in the number of companies now interviewing their graduates in comparison to pre-war years.

This latest manpower shortage, Muller predicted, will last well into 1949 or 1950. It stems directly from industrial expansion, coupled with the relatively few engineers and scientists graduated from colleges during the war. Westinghouse is now recruiting from the colleges over 100 more men each year than during pre-war years.

Lighting exposition to feature post-war lighting equipment

The first real showing of new post-war lighting equipment will be held at the 2nd International Lighting Exposition and Conference to be held in Chicago at the Stevens Hotel, November 3-7.

More than 80 exhibitors will answer the question, "What Is New in Lighting?" with hundreds of new lighting units for factories, offices, schools, service stations, streets and

highways, airports, sports afields, and other commercial applications. Many of these units will be given their first public showing at the Exposition. Hundreds of the units were only on the drawing boards 18 months ago when the first Exposition was held.

Fall meeting of ACS Central Ohio Section

Members and their wives gathered in the Granville Inn, Granville, Ohio, September 26, for the regular fall meeting of the Central Ohio Section of the American Ceramic Society.

Included among the papers presented on the men's program were "Proposed Standard Methods for Determining Leachability of Lead from

Lead Frits," by Arthur E. Carrier, Ohio State University Engineering Experiment Station, and "Aircraft Ceramic Materials," by Winston H. Duckworth, Battelle Memorial Institute, Columbus, Ohio.

Included on the ladies' program was a talk by Prof. R. M. King, Department of Ceramic Engineering, Ohio State University, entitled "Selecting Porcelain Enamel Ware for the Home."

Following the dinner, door prizes were presented. The audience then adjourned to the lecture room where the evening speaker, Frank Davidson of Owens Corning Fiberglas Corp., Newark, Ohio, gave an address on "Domestic Applications of Fiberglas in the Home."

Sears features porcelain enameled heater



Advertising in a current catalog of Sears, Roebuck and Co. features a circulating coal heater with a porcelain enamel finish. The heater cabinet is finished in walnut color porcelain enamel on front, sides and top. According to the advertisement, the

heater has a good appearance from any angle, and may be placed anywhere in the room.

NESA convention and exhibit

The annual Convention and Equipment Exhibit, sponsored by the Na-

tional Electric Sign Association, will be held at the Stevens Hotel in Chicago, January 19, 20 and 21.

A preliminary survey among prospective exhibitors indicates that approximately 50 equipment manufacturers will have displays as compared with 30 last year.

NYU College of Engineering adds to teaching staff

Seven professors and 13 instructors were added to the staff of the New York University College of Engineering during the fall semester, and seven faculty members were promoted in rank, Dean Thorndike Saville has announced.

The professorial appointments included: Dr. John P. Nielsen, associate professor of metal science; Dr. Yale K. Roots, associate professor of physics; and Dr. Nicholas Kulik, assistant professor of mechanical engineering.

Swiss subsidiary formed by Minneapolis-Honeywell

The organization of a new subsidiary company in Switzerland has been announced by Harold W. Sweatt, president, Minneapolis-Honeywell Regulator Company.

The Swiss organization will handle sales and service of the complete line of Honeywell controls as well as all of the industrial recording and controlling devices made by the Brown Instrument Company, a Honeywell subsidiary. Intensified interest in automatic heating as well as growing industrial activity in Switzerland were cited by Sweatt as reasons behind the formation of the new company.

Charles B. Meech has been transferred to Zurich as manager of the Swiss subsidiary.

AGA directs "million dollar" promotion of automatic gas ranges

A "million dollar" industry-wide effort is being directed by the American Gas Association to acquaint the public with the features of modern automatic gas ranges and to stimulate replacement of the more than 12.5

million outmoded gas ranges now on utility lines. No campaign in the 11 years of Association national advertising has created such enthusiasm among gas utility and manufacturers throughout the industry as this all-out drive for modern, automatic gas ranges built to "CP" standards, says AGA.

The Association's own advertising space will be allotted to manufacturers of gas ranges built to "CP" standards where the manufacturer's planned national advertising expenditure exceeds \$50,000. The Association will offer 50 cents of its own space for each dollar the manufacturer spends for national advertising with a ceiling of \$150,000 worth of Association space. Manufacturers who advertise regionally are offered 25 cents of AGA space for each dollar they spend.

Bendix names Brennan to post of chief industrial engineer



The appointment of Brian E. (Bill) Brennan as chief industrial engineer of Bendix Home Appliances, Inc., South Bend, Ind., has been announced by Harry L. Spencer, vice president in charge of manufacturing, who also announced the appointment of Allen R. Sowle as master mechanic.

Brennan's previous affiliations included the Brennan Engineering Co., Chicago; Norge division of Borg-Warner Corp., Muskegon, Michigan; Newark Stove Co., Newark, Ohio; Sears Roebuck & Co., Chicago; XLO Corporation, Detroit; Pioneer Engi-

neering and Manufacturing Co., Detroit.

The Youngstown Sheet and Tube Company received five awards at the National Safety Congress held in Chicago the week of October 6.

Yale & Towne advances Robinson



David Y. Robinson has been appointed sales manager of electric heating units for The Yale & Towne Manufacturing Company, according to an announcement made public by W. Gibson Carey, Jr., president. The firm has just expanded its industrial products to include a general line of enclosed electric heating units, said Carey.

Robinson joined the Yale & Towne organization last February. He formerly was associated with Tuttle & Kift, Inc., Chicago, and also with Edwin L. Wiegand Co., Pittsburgh.

Porcelain enameled plumbing fixture shipments up for second quarter

Shipments of porcelain enameled plumbing fixtures for the second quarter of 1947 showed slight increases over shipments reported for the first quarter of this year, according to the Porcelain Enamel Institute.

More than 340,000 porcelain enameled lavatory units were shipped, an increase of 24,000 units over the first quarter; 305,000 cast iron kitchen sinks, an increase of 20,000 units;

423,000 bathtubs, an increase of 40,000 units. Quarterly bathtub shipments have almost doubled during the past year. Steel sinks showed a slight decline from over 400,000 units in the first quarter to a second quarter figure of 333,000.

Ernest W. Polley has been appointed assistant chief chemist for the Youngstown district of The Youngstown Sheet and Tube Company. He succeeds L. C. Flickinger who recently was appointed chief chemist following the death of D. A. Russell.

New low-priced aluminum sheet

As a result of development work begun over two years ago, Reynolds Metals Co., Louisville, Ky., has perfected a new type of sheet aluminum which the company says is available at prices about 15 per cent below any aluminum previously offered the sheet metal industries. The new material is suitable for use in a wide range of products and is particularly well adapted for fabrication work, according to a company report.

Hotpoint launches home laundry sales promotion under Sweetland



Under L. I. Sweetland, newly appointed manager of the home laundry division, Hotpoint, Inc., merchandising operations will be stepped-up, according to Leonard C. Truesdell, vice president of marketing. Sales of washers, ironers and clothes dryers

*Modern
Styling*



IS JUST CAREFUL
THINKING

For New Monarch Machine and Stamping Co., thinking and planning are the order of the day. A result is the New Cole draft regulator shown above. Monarch's careful engineering and designing have eliminated so many parts and so greatly simplified the assembly of this product, that the result is this smooth, streamlined regulator — a piece of merchandise of which the Cole-Sewell Engineering Company and we are justly proud.

Our long range planning and close cooperation with our clientele enable us to cope with unusual problems in styling and speeding up production.

Our service is complete from blue print to shipping carton. Write for further information.



When you think of Stampings, think of

NEW MONARCH MACHINE & STAMPING CO.

406 S. W. NINTH STREET

DES MOINES 9, IOWA

will be promoted with the same general program of completely planned work centers that Hotpoint used in the merchandising of kitchen appliances.

Although production of all appliances at Hotpoint has reached new peaks, with even greater capacity expected next year. Truesdell said that dealers would remain on allocation for all kitchen and laundry appliances for some time.

Enameled artwork on display at Saddle River exhibit

To mark the opening of the new Saddle River Handcrafters, Saddle River, N. J., August 30, a special exhibition of exquisite hand wrought articles by some of America's most gifted artists was arranged.

On display with other handcraft were hand painted porcelain brooches and ear ring sets, designed and executed by Victoria Fleming, and some individually designed enamel masterpieces by Harold Tishler, whose work

has been exhibited in the Metropolitan Museum of Art.

U. of I. news

Some of the appointments and changes in the teaching and research staff of the Department of Ceramic Engineering, University of Illinois, at the opening of the fall semester, October 8, are as follows:

E. D. Lynch appointed Assistant Professor; R. J. McEvoy appointed as an Assistant in the Department; Dr. R. L. Cook promoted to Professor; C. D. Brunner appointed to the Orton Fellowship.

Dr. W. R. Morgan joined the staff as Special Research Professor, and is cooperating with Prof. R. K. Hursh in carrying out a research project for the Industrial Research and Development Division, Department of Commerce.

On the Enameled Utensils Manufacturers' Council research project, Professor F. A. Petersen was promoted to Special Research Professor, and A. L. Friedberg was promoted to

Special Research Associate.

On the Army Air Forces research project, W. J. Plankenhorn was promoted to Special Research Associate Professor. Several members of the present staff promoted to Special Research Associate include J. E. Comerford, J. W. Graham, L. R. McCreight, T. F. Newkirk, R. F. Kimpel and R. J. Beals.

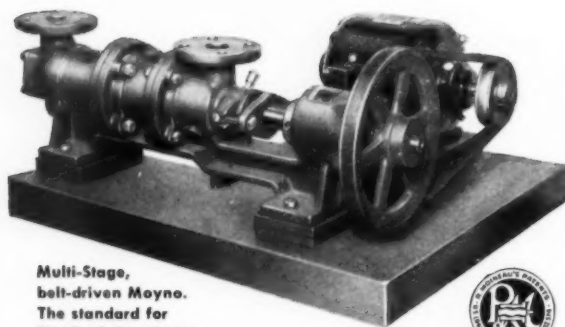
Gordon Sliter promoted

Gordon Sliter, with Clyde Porcelain Steel Corporation since September, 1944, was recently promoted to production manager. In this capacity he is in charge of all purchasing, shipping, production scheduling and billing (each department has a production head reporting to Sliter).

Chicago enamelers select speaker for December meeting

Dr. A. I. Andrews, Head of the Department of Ceramic Engineering, University of Illinois, has been selected as the principal speaker for

MOYNO is your best pump for abrasives



Multi-Stage, belt-driven Moyno. The standard for Dip Tank Circulation.



Here is the pump that's known throughout the industry for its ability to pump virtually anything—and keep on pumping it! The Moyno knows no type limitations—handles porcelain, clay slip, enamel, and chemicals with equal ease—stands up on the most difficult jobs.

A MARVEL OF SIMPLICITY AND DEPENDABILITY

The Moyno has *only one moving part*. No pistons to score, no valves to stick, no delicate vanes or high-speed impellers to break when the going is tough. A patented helical rotor turns in a double helical stator—creates *wedging* action that pumps practically *everything* from liquids to non-pourable pastes. Ever-changing seal lines resist chemicals and abrasives—distribute wear *evenly* over the *entire* rotor and stator surfaces.

Moynos are self-priming. Reversible. Versatile. Deliver positive, *non-pulsating* pressures up to 1,000 p.s.i. Bearings are *outside* the pumping compartment.

BOOKLET TELLS HOW MOYNOS CAN SERVE YOU

Yes, the Moyno *is* amazing. Let us send you our *free* booklet "A Turn for the Better." It explains the principle—gives applications, capacities, pressures, dimensions. Write *today* for your copy.

ROBBINS & MYERS, INC. MOYNO PUMP DIVISION
Springfield 99, Ohio • Brantford, Ontario
MOTORS • HOISTS • CRANES • FANS • MOYNO PUMPS • FOUNDED 1878

the next meeting of the Chicago District Enamelers Club to be held December 6.

New Verson representative

A. C. (Art) Berges will handle the line of hydraulic and mechanical presses and press brakes in the Detroit territory for the Verson Allsteel Press Company, Chicago, according to an announcement by L. Ray and Fred L. Phipps, Michigan representatives of the organization.

Prior to his appointment as a Verson manufacturing representative, Berges was Michigan sales manager for the E. W. Bliss Company.

Washer-ironer sales continue climb to reach new all-time high

Industry-wide sales of standard-size household washers set an all-time high in August, aggregating 323,063, topping the record of 320,969 units set in April and comparing to 318,297 in July, according to figures announced by the American Washer and Ironer Manufacturers' Association.

Sales for the eight months of 1947 amounted to 2,395,999, compared to 2,023,981 for all of 1946 and 1,959,887 for all of 1941, largest pre-war year.

Sales of small washers with a capacity of three pounds or less, dry weight, totalled 43,834 units in August, compared to 36,471 in July. The eight-month total is 331,575.

Ironer sales in August were 47,577, compared to 41,911 in July. The 1947 total is 357,797, compared to 124,616 in all 1946 and 215,994 in all 1941.

ACS Pittsburgh Section annual fall outing

One hundred and twenty-five members and guests of the Pittsburgh Section, American Ceramic Society, attended the annual fall outing at the Nemaquin Country Club, September 19. The day was perfect for golfing and plant trips.

Tours were conducted through the Duncan and Miller Glass plant, Wash-

to Page 56 →

finish NOVEMBER • 1947

Once
**THROUGH
IS
ENOUGH!**



WITH THE
DINGS
DE-IRONER

Slip — whether recovered or new — needs only one pass through the Dings De-Ironer for thorough cleaning by removal of iron particles. This "one-pass" separator has no secret mechanism . . . It is more powerful and does a better job simply as a result of an accurately balanced magnetic circuit having longer coil windings for greater magnetic intensity; and many more lineal feet of stainless steel grid area to catch and hold iron present in the slip. *Dings De-Ironers, size for size, have 20% to 30% greater capacity than any other separators of similar type.*

Write today for full information on the right Dings De-Ironer for low cost, "one-pass" magnetic separation in your plant.

DINGS MAGNETIC SEPARATOR CO.
4750 W. McGeogh Avenue
Milwaukee 14, Wisconsin

Dings
"HIGH INTENSITY"

De-Ironer Features:

- ✓ 20% to 30% greater capacity, size for size, than any other magnetic separator of this type.
- ✓ Stainless steel grids—spot welded and heavily chrome plated.
- ✓ Open or pressure models available—can be operated top-to-bottom or bottom-to-top.
- ✓ Solenoid safety valve, with only one moving part, prevents slip contamination in case of current failure.
- ✓ Float valve insures complete coverage of grids while De-Ironer is working.

Coils wound for continuous "High Intensity" operation.

*"Separation Headquarters
Since 1899"*

New industrial literature

Catalog of control instruments

A newly published catalog, "Air Operated Controllers," contains information on instruments for the automatic control of industrial processes. Incorporated in the book are descriptions of control instruments for temperature, pressure, flow, liquid level and humidity.

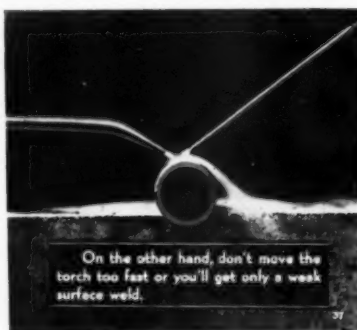
A copy of this 40-page catalog, No. 8905, will be sent upon written request to The Brown Instrument Company, Wayne & Roberts Avenues, Philadelphia 44, Pa.

Motion pictures and slide films on welding techniques

A series of motion pictures and slide films on welding subjects are now available to trade schools and industry.

During the war, the training of welders became a primary job in get-

ting into production stride, and numerous methods, mediums, and techniques were enlisted to speed up this training. Among them were visual aids of several types, including a series of 15 "discussional-type" slide



On the other hand, don't move the torch too fast or you'll get only a weak surface weld.

films, "Oxyacetylene Welding" now being made available for peacetime uses.

There is also available a 16 mm motion picture supplementary to the slide films, "Introduction to Weld-

ing." The purpose of these films is to acquaint the apprentice or learner with the tools and purposes of welding and with their basic techniques previous to shop demonstration with the actual tools. The films also provide foremen or other instructors with a well organized series of lessons in welding. These supplementary visual teaching aids are used in connection with (a) text book study, (b) talks or lectures, and (c) shop demonstrations.

Titles in this series are: An Introduction to Welding, Setting up and Lighting the Welding Torch, Welding Flat Ripples, Flat Butt Welds, Fillet Welds—Steel, Vertical Welds—Steel, Tube Welds—Steel, Cluster Welds, Welding Stainless Steel, Welding Aluminum Flat Sheets, Welding Aluminum Tubes with Sheets, Fuel and Oil Tank Repairs, Oxyacetylene Cutting, Brazing and Silver Soldering, and Qualifications Tests for Welders.

Contact Jam Handy Organization, 230 N. Michigan Avenue, Chicago.



Water in compressed air lines is tough on air tools, sprayed finishes, sand-blast equipment . . . and it's tough to eliminate—but not with Aridifier, the "waterweight" champion. Those counter-rotating rotors deliver the knockout punch—spin air clean and dry by centrifugal force. Dirt, water, oil and scale are impinged on rotors and hurled free of air stream to flow to drain. No baffles or filters to cause back pressure . . . stays clean. Join the thousands of "Riddy" boosters—write for bulletin and details of free trial offer.

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Dries and Cleans Compressed Air



Prompt and Dependable Enameling Service

If you have sheet metal products that need the protection of lifetime porcelain enamel, contact us for prompt service. At Lawndale we operate around the clock to give the kind of jobbing service that manufacturers need.

Check with us in the design stage of your next job, and you may save money on the finished product.

Lawndale Enameling Company

1137-1139 West 14th Street
Chicago 8, Ill.

Telephone CHESAPEAKE 5495

Burner design bulletin reprinted

Research bulletin No. 10, "Research in Fundamentals of Atmospheric Gas Burner Design," has been reprinted and is available from the American Gas Association Testing Laboratories.

Consisting of nearly 200 pages, this research bulletin provides, besides original work, burner design data on ranges and water heaters presented in previous bulletins.

Pipe and fin coil calculation

A new 34-page engineer data book contains fundamentals of pipe and fin coil calculation. It treats heat transfer "K" factors on all ranges of heating and cooling from minus 60 to plus 350° F.; gives recommended air velocities and fin spacing for fin coils; shows in detail how to calculate and design pipe and fin coils for all generally encountered heating and cooling loads.

Contact the Rempe Company, 340 North Sacramento Blvd., Chicago 12, Ill.

Booklet about mounted wheels on portable grinders

Practical methods for increasing production, improving workmanship and reducing costs with light portable grinding equipment are described in "Mounted Wheels," a new 32-page illustrated handbook.

A wide range of wheel shapes and sizes, a variety of abrasives and coated abrasive discs, sleeves and cartridge rolls for use on light-weight, high-speed portable grinders are discussed and depicted.

Copies of the booklet may be obtained by writing The Carborundum Company, Niagara Falls, N. Y.

Bulletin on single spindle automatic machine

A new bulletin illustrates and describes a new 2½" single spindle, five-hole turret, automatic machine which is equipped with an electric feed drive and can be used either as a bar machine or a chucker.

This 6-page bulletin, describing the machine known as the Model AB

Cleveland "Dialmatic," may be obtained from The Cleveland Automatic Machine Co., 4932 Beech St., Cincinnati 12, Ohio.

New rectangular magnet catalog

A 12-page catalog describing rectangular double-gap electro-magnetic, suspended, spout and plate magnets and wet-type magnets for submerged installations has just been issued.

The new catalog, designated as 301-A, includes drawings, illustrations of installations, specification data, and the first printed description of a new self-cleaning rectangular magnet — a suspended magnet equipped with a cross belt which automatically discharges iron.

Copies of the catalog may be secured from Dings Magnetic Separator Co., 4740 W. McGeogh Ave., Milwaukee 14, Wis.

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For information as to available quantities and prices, write, wire or phone . . .

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Cleveland, 14, Ohio

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Like most of the leading enameling plants, C. V. Hill, at Trenton, Rotospray their enamel slip.



It is not by accident that you will find the leading enameling plants the country over relying on the Rotospray sifter for all of their sieving problems. Rotospraying earned its place in the porcelain enameling industry with hundreds upon hundreds of installations, every one doing a thorough job, and continuing to do the job year in and year out.

The first Rotosprays built for service in enameling plants are still in daily use, and in most instances they have been joined by "big" or "little brother" Rotosprays as a result of the effective job done by first ones put in use. If you aren't Rotospraying in your plant, you are not using the system recognized as **STANDARD** in enameling plants today.

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are: (1) it supplies a detailed description of job content for each job; (2) it provides a means of arriving at the relationship between jobs, departmentally and inter-departmentally, through facts which can be defended in case of question; (3) it avoids inequitable differences in wage levels between departments for comparable work; (4) it establishes definite factors upon which job wages can be based, thus avoiding over and under-payment of jobs with relation to one another; (5) it provides a basis for the adjustment of job wages which are definitely out of line; (6) in the case of new jobs, it permits an accurate comparison with similar jobs, or if no similar jobs are present, it furnishes an accurate means of evaluating these jobs, thus aiding in determining fair differentials; (7) it can improve methods of selection, transfer and promotion by indicating similar requirements of different jobs, and the hiring requirements of any particular job; (8) it indicates hazards requiring consideration of physical fitness and safety instructions at the time of hiring, and (9) it facilitates the making of wage surveys.

Wage incentives

The primary purpose of an incentive plan of wage payment is to bring about reduction of unit costs and, at the same time, improve the earnings of employees.

No wage incentive plan will be a cure-all for cost, production and wage problems, nor will any incentive plan automatically bring about an amazing increase in production. The adoption of any kind of incentive plan is a major policy decision, to be undertaken only after careful consideration by top management. Its installation and administration must be entrusted only to specialists skilled in the necessary techniques and familiar with the operations of the plant. Moreover, they must understand human nature. Once put into effect, no plan will run itself. It must be properly maintained and administered. Supervisors should understand the program and promote the employees' understanding of it.

One fundamental which management must understand in relation to wage incentives, is that wages change with economic conditions whereas correct times to perform tasks do not.

Experience indicates that wage incentives are most effective where an employee's individual contribution to added production results in increased earnings to him.

Almost any wage incentive plan may be made to work more or less satisfactorily if work standards are accurately established, whereas no method will give permanently satisfactory results if standards are inaccurate.

Competent time studies, motion

studies, analyses and establishment of most economical quantities and methods, and speed and fatigue rating will take care of the determination of time standards. The careful rating of each job or kind of work according to specific factors such as skill, effort, responsibility and job conditions will provide a definite relationship of one kind of work with another in terms of the values of those specific factors—from which may be developed a scale of job wage rates for all jobs from the lowest to the highest rated jobs in the shop. Those rates may in turn be used to establish base rates for incentive wage payment.

Authors' resumés, editor's reports and excerpts from complete papers presented at the Porcelain Enamel Institute Forum are being published as space permits. The list of authors of papers published in the October and November issues is presented herewith.

The authors

H. C. Ellinger, Philco Corporation, Philadelphia, Pa. (November)

A. C. Francisco, P.E.I. Research Fellow, National Bureau of Standards, Washington, D. C. (October)

J. E. Hansen, Ferro Enamel Corporation, Cleveland, Ohio. (October)

E. A. Jamison, Phillips Petroleum Company, Bartlesville, Oklahoma. (November)

William Jones, The North American Manufacturing Company, Cleve-

land, Ohio. (November)

A. M. Langhein, American Stove Company, St. Louis, Mo. (October)

Joseph M. Schappert, National Metal Trades Association, Chicago, Illinois. (November)

S. E. Shepard, The North American Manufacturing Company, Cleveland, Ohio. (November)

George N. Tuttle, Benjamin Electric Manufacturing Company, Des Plaines, Illinois. (October)

Bright annealing for cleaning kitchenware prior to porcelain enameling

(Continued from Page 20)

perature volatilizes the impurities. Second, the flow of gas creates a washing action which flushes this from the surface of the parts. Third, the constituents of the gas ($\text{CO} + \text{H}_2$) react with the surface oxides on the ware and reduce them to pure metal. These surface oxides from electric welding then reduced to pure metal tend to strengthen the weld itself, as has been shown in magnified photos.

Acetylene welding cannot be cleaned up completely by atmosphere annealing. A fine, loose metallic powder remains which can be easily

brushed off. This method completely eliminates pickle blisters and fish scale, as well as other defects which have been attributed to pickling.

The dipping, and I believe draining (although we do no draining), of ground coat is easier as the surface is a clean neutral one with no alkali or neutralizers to hold or retard the flow of enamel. The ware that has been atmosphere annealed does not tend to rust any sooner than pickled ware.

As for the standard tests set up by the Enameled Utensil Manufac-

to Page 56 →

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YEARS



The weight of **EXPERIENCE...**

The weight of years is a handicap unless crowded with desire to move forward—to enlarge a record of things accomplished—or as a base from which to project the imagination into the future.

At Pemco the years of experience weigh heavily in balancing the progress of the entire porcelain enameling industry.

Year after year, new finishes by Pemco, leave their mark in greater beauty, smoother production, less costly production, greater production.

By drawing upon the past to solve the faults of the future the industry's **ONLY WHOLLY CONTINUOUS SMELTER** was conceived, created, and made to work for you in establishing a uniformity of product unequalled by any other method. Definitely the experience of Pemco weighs heavily in solving the individual problems of its customers and those who buy elsewhere. It created and perfected the Basic Colors for simplification of color matching. It calls upon the spectrophotometer for more accurate color analysis. It offers you these and a hundred other ideas designed to simplify your job . . . **FREE** and without obligation. A service yours for the asking. Why not make use of it.



PEMCO CORPORATION

Baltimore 24,



Maryland

Always Begin With a Good Finish

→ from Page 53

turers Council, there is no difference in results between annealed and pickled ware. The advantages of bright annealing are: the replacing of messy pickling tanks with clean, dry furnace equipment; operating personnel is substantially reduced; stresses from drawing and welding are relieved; non-enameling or commercial grade stock can be used.

The biggest difficulty that has been encountered is getting the proper tooling to support the ware to eliminate warping. To this end we have been successful with kitchenware. This will have to be worked out for different lines of material handled, although it should not be too difficult as the temperature is comparable to the firing temperature of ground coat. The furnace we are using was not designed for cleaning, but for brazing.

There has been considerable work done with pre-heating which tends to materially reduce warpage when the work enters the high heat chamber. In conclusion, I wish to state that with this method of preparing metal for enameling temperatures (which we have had as low as 1450° F.), time in furnace, tooling and loading will differ considerably between flat ware and deep drawn welded ware, and ware that has become very rusty. The deep drawn ware usually has a heavier coating of drawing compound and may need a slightly higher temperature than flat or shallow ware. We have never had to do anything more to our ware. It is taken directly from press or stock room through furnace then directly to ground coat dipping.

Adapted for finish from a talk before the Porcelain Enamel Institute Ninth Annual Forum.

Chicago enamellers fall meeting

(Continued from Page 28)

nor cooled in less than two or three days. Seven days should be taken to bring a new furnace up to 1600° F. Fast firing and cooling prevent a furnace from making compensation for uneven expansion or contraction.

Personnel problems from the psychologist's viewpoint

Dr. W. J. Humber, a consulting psychologist, followed with an address, "Motivation, the Key to Industrial Success."

The theme of Humber's talk was directed toward getting industry and employee together at that point which would be most beneficial to both. He said that much talent lies hidden in industrial personnel. To place a person in a job which is pleasing to himself and also of benefit to the company is very important.

This placement of company personnel can be secured through aptitude tests which vary for different jobs. As Dr. Humber pointed out, for a job of supervision level, personality is much more important than time reaction. In an interview of a prospective supervisor, the following

subjects should be discussed thoroughly: (1) mental efficiency; (2) emotional stability, (3) social skills, (4) organizational ability, and (5) insight.

Dr. Humber continued by saying that everyone should have a chance to get at least a high school education, and also have a chance to reach his goal in life. From a psychological point of view, it is not so important whether a person succeeds after he reaches his goal, but the fact that he had his chance is what matters.

In many instances some people could better themselves in different occupations whether they knew it or not. Dr. Humber pointed out that during the past war many individuals discovered a capacity for work of a nature they never dreamed they could handle.

NEWS → from Page 49

ington, Pa., and through the Robena Mine, U. S. Steel Company.

During the business meeting, following the dinner, A. P. Thompson

was presented with a society key by the section in token of the work he had done as chairman for the past term.

Guests from outside the section included Kenneth A. Rugh, president of the Pennsylvania Ceramic Association; L. E. Ohrstedt, of the Columbus office, American Ceramic Society; and C. B. Brewer, of Dominion Minerals, Piney River, Virginia.

Gas sales gain in August

Total sales of the gas utility industry to ultimate consumers in August were 1,983,820,000 therms, a gain of 3.2 per cent over the comparable month in 1946, the American Gas Association reports.

Natural gas sales in August totaled 1,779,852,000 therms; mixed gas sales aggregated 69,870,000 therms; and manufactured gas sales added up to 134,098,000 therms.

Lochridge joins U.S. Stamping

Word comes to *finish* that James F. Lochridge has joined the United States Stamping Company, Mounts-ville, West Virginia, as a ceramic engineer.

Lochridge recently received a B.S. degree in ceramic engineering from the University of Illinois where he worked as part time assistant to Professors Ralph L. Cook and F. A. Petersen.

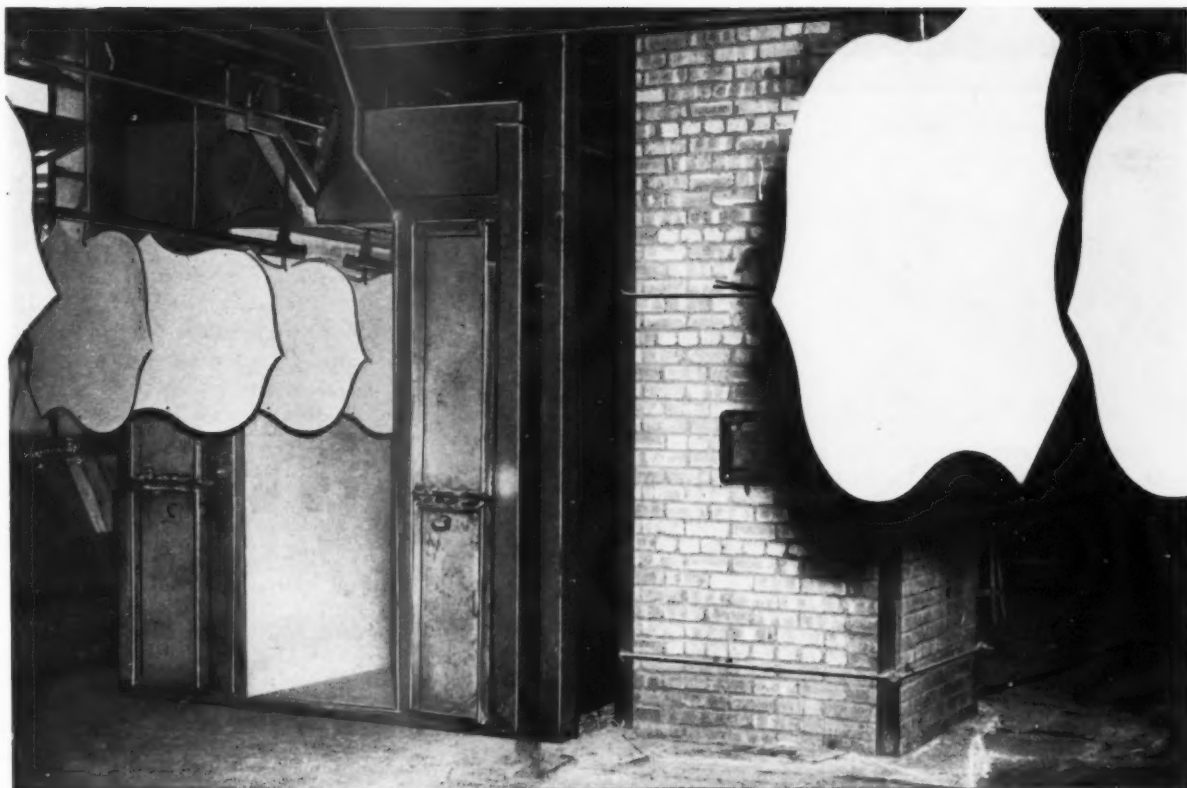
Air marking firm suggests porcelain enamel

Air Markings, Inc. is the name of a company at 79 Milk Street, Boston, Massachusetts, which was formed to promote the sale of air markers. Inasmuch as *finish* has been active in the promotion of porcelain enameled air markers to promote safety in non-scheduled flying, we are pleased to introduce this company to the porcelain enameling industry.

The following is quoted from the literature of Air Markings, Inc.:

"More than any other business, airports and operators need good standard air markers well located in

to Page 60 →



A new Boland continuous furnace at General Porcelain Enameling & Manufacturing Co., Chicago, Illinois

Still another **BOLAND Single Flow Furnace** is producing better ware — —

To produce brilliant attention-getting signs in many colors — colors that are uniform from load to load — requires temperature control. In a Boland **SINGLE FLOW** continuous furnace you get even heating on both sides of the ware and positive temperature control.

Not only for signs but for ranges, refrigerators, heaters, table tops, sinks or any other fabricated product, the controlled heat of the Boland firing zone means better quality ware, free of distortion.

You certainly want these features in your next continuous furnace, and in addition you will want to know that your furnace is built to stand up, day in and day out, year in and year out. One feature you will want, to insure this durability, is the Boland patented **FLOATING ROOF**.

It costs you nothing to discuss your furnace problems with Boland, and it may pay big dividends in economical operation and better quality ware.

ALBERT J. BOLAND COMPANY

407 NORTH EIGHTH BUILDING • ST. LOUIS 1, MO.

Designers and Builders of Continuous and Box Type Enameling Furnaces
finish NOVEMBER • 1947

New Supplies and Equipment

Alnico magnetic pulley



A new permanent magnetic pulley with alnico poles is available in 53 sizes ranging from 12" diameter x 12" width to 30" diameter x 60" width. Designed for use as head pulleys in a belt conveyor system or in a self-contained magnetic pulley-type separator unit, these magnets are used to remove magnetic substances automatically from non-magnetic materials carried on the belt. Being of permanent magnet construction, no electrical wiring is required.

Known as the Perma-Pulley, it is guaranteed magnetic permanence forever by the manufacturer provided

the magnet is properly used. For further information contact the Dings Magnetic Separator Co., Milwaukee, Wis.

New development in screw anchors

A new development now makes available a universal all-purpose screw anchor. The plastic expanding anchor simplifies anchoring, and reduces costs, according to the manufacturer of this new product.

Overlapping internal and external slits give the "Concertina" expansion. The anchors may be used with wood screws for fastening into any material, such as: concrete, brick, plaster, tile, stone, marble, terra cotta, composition boards, slate, metal, bakelite, rubber, glass, stucco, wood, etc. The anchors are also said to be unaffected by water, weather or acids, and immune to age and corrosion. They are available in sizes from No. 5 to 20.

For further information, contact Holub Industries, Inc., Sycamore, Ill.

New temperature-recording instrument



A new temperature-recording instrument which determines temperature gradients in continuous porcelain enameling furnaces has been developed by M. Bozin, process research supervisor, and C. A. Vana, chemical engineer in the research laboratory of Ferro Enamel Corpo-

ration, Cleveland, Ohio.

Dubbed "Hot Hawkshaw" the thermal ferret, this new electronic three-point recorder is said to determine the exact temperature of the ware in the furnace and at various levels; also the differences in temperature of light gauge and heavy gauge ware,

or furnace loadings and of burner adjustments. By means of the new instrument, the actual ware temperature can be automatically recorded, and the operator can set the furnace control instruments accordingly.

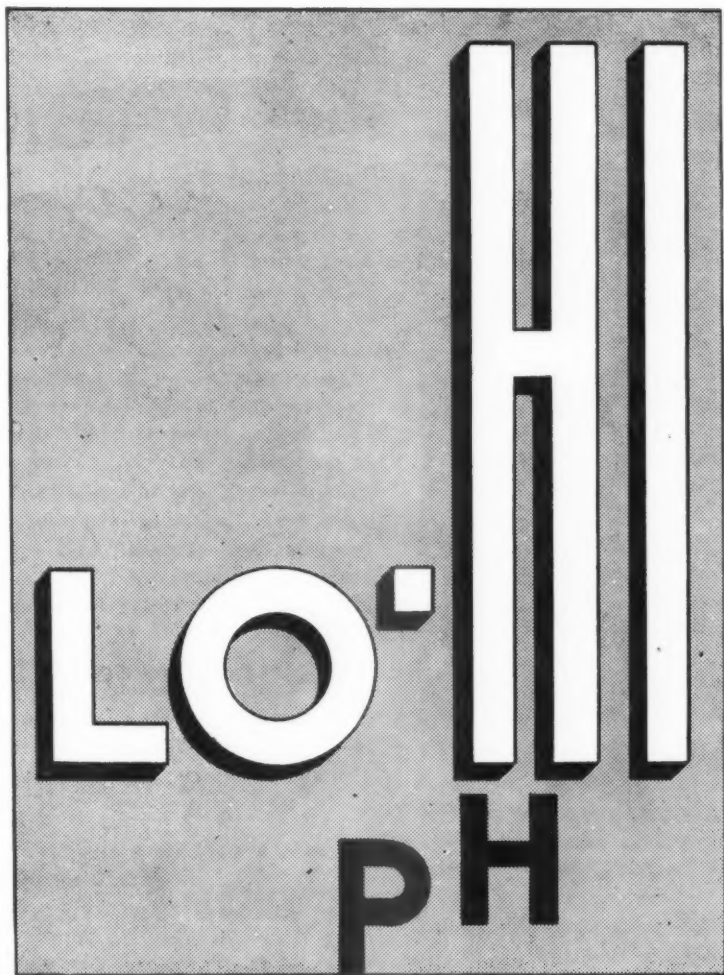
In operation, the unit is hung on the conveyor chain and run through the furnace while operating at normal load. Three thermocouples are placed to touch the ware at the point where temperatures are to be recorded. The instrument then records the temperature every three seconds throughout the length of the furnace. The chart is then removed from the instrument for interpretation.

New tester handles larger specimens



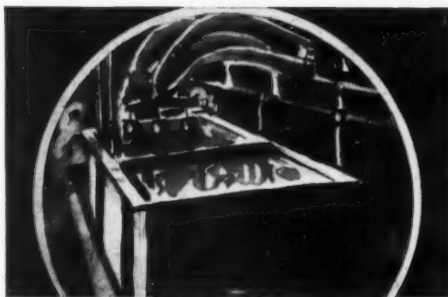
Testing longer specimens, as well as specimens that show considerable stretch, is an outstanding improvement effected by this new physical tester. This has been accomplished by lengthening the uprights to give a 13-inch spread between grips. A keyless power screw is prevented from turning by means of a special, ball bearing-held yoke. Grips are interchanged to handle tensile, transverse, compression, or shear tests.

For further information, contact W. C. Dillon & Co., Inc., 5410 West Harrison Street, Chicago 44, Ill.



BETTER.. FASTER. LOWER COST CLEANING

Due to a recent improvement in product . . . in method of charging . . . in control . . . our "Lo-Hi" pH Cleaning Process is better today than ever . . . Whether manually operated or fully automatic, if your pickling procedure is orthodox, "Lo-Hi" will do your job better — faster and at lower cost regardless of type of steel or soil . . . Let us prove it at your convenience and if you are not convinced — it will be at our expense.



NORTHWEST CHEMICAL CO.
9310 ROSELAWN DETROIT 4, MICH.



pioneers in pH cleaning control — serving you since

'32

—> from Page 56

the vicinity and at the airport. Their business depends on flying, and safe flying depends on air marking.

"We recommend, wherever possible, maintenance-free porcelain enamel markers . . ."

A nine-man enameling team



This group of key men "make the wheels go 'round'" in the Cleveland, Ohio, plant described in this issue of *finish*. (See "A Two Continuous Furnace Plant for Stove Work and Jobbing," page 15.)

At the photographer's request, the *finish* editor's car was placed in the proper spot so that when the men lined up it wouldn't be hard to deter-

mine the company they represented. From left to right in the photograph are: R. Teel, chief inspector; R. Cooper, ceramic engineer; A. Sieker, foreman; H. Houk, plant superintendent; V. Cichowski, works manager; J. D. Henry, Jr., personnel and production control supervisor; G. Wallis, foreman; G. English, foreman; and J. Cercek, control man.

PEI sixteenth annual meeting and first sales and management conference

(Continued from Page 27)

there is increasing opportunity for those materials of greater total unit measurement.

Opportunities in the sign field

As is his usual procedure, Paul R. Fritsch, Goodyear's sign specialist, got down to earth fast in his talk, "Get Selling Out of the Strait-Jacket," and presented all enamellers interested in the sign field with a good many things to think about in relation to the production, sale, and servicing of their product.

According to Fritsch, the sign industry has done a good job in producing the parts as regards variety, quantity and quality, "but so long

as the industry continues to be a group of parts manufacturers, it can not hope to have the prestige that is enjoyed by other forms of advertising. Signs will not appear on advertising budgets as a major media (along with direct mail, radio, newspaper and magazine advertising, and outdoor advertising) until the industry undertakes to teach organized assembly and the use of the parts."

In closing, he said, "Members of the Porcelain Enamel Institute should be regarded as more than a source for lifetime finish. They should be a source of good counsel. Identification programs should be as enduring

and practical as the lifetime finish."

The woman's viewpoint

Edith Ramsay, home equipment editor, *American Home Magazine*, was extremely candid in some of her remarks presented under the title "How to Sell Porcelain Enamel to the Housewife." It's one thing to manufacture a porcelain enameled product that has mechanical soundness and sales floor appeal, but it would seem to be a far safer policy for the manufacturer to determine the desires of the ultimate user and then make an honest attempt to meet these requirements. This speaker pointed out the fact that style and color are selling many, many table tops other than porcelain enamel. She urged the discarding of "mottled blue" stove linings in favor of white porcelain enameled ovens.

Miss Ramsay may have shattered a few of the traditional ideas of industry members, but she unquestionably brought each listener closer to a true picture of the housewife's needs and desires.

Enameled utensil manufacturers program a success

The question of "How the Porcelain Enameled Kitchen Utensil Manufacturers Met a Competitive Market" was effectively demonstrated by D. S. Hunter, representing the Enameled Utensil Manufacturers' Council. With charts to illustrate his points, Mr. Hunter showed how this comparatively small group of manufacturers first banded together for cooperative research to improve their products, and then, through cooperation of 14 producers, launched a publicity and advertising program. The program described is approximately six times the size (in dollars) of the complete program of the Porcelain Enamel Institute. Mr. Hunter also had sales curves to show the relationship between promotion and a greatly expanding market for porcelain enameled ware.

Market research explained

In his usual thorough manner, Floyd Woleslagle, Carnegie-Illinois Steel Corporation, told the complete story of "Market Research Proceed-

ures and Evaluation" through the medium of a full-color slide film. His presentation included much data resulting from the work of the Market Research Committee of the Porcelain Enamel Institute which has been invaluable to the Institute and its Market Development Division in planning an effective sales promotion and advertising program for the industry.

Sales insurance

R. A. Dadisman, American Rolling Mill Company, spark plug of the PEI Market Development Committee, closed the Institute's part of the program with a talk "Sales Insurance for Your Business." Dadisman's long and close association with PEI activity was reflected in his analogy between a sound sales and advertising program and the insurance which

every one considers so necessary to personal welfare. Not only did he outline the Institute program of sales and advertising designed to aid all members and the industry as a whole, but he proved conclusively that the program itself was based on sound business judgment.

Finale

As stemwinder and dramatic closer for a full day of important selling messages, the capable and personable Arthur H. "Red" Motley, president of Parade Publication, Inc., proved his reputed ability to inspire an audience by keeping his listeners glued to their seats while he told them what they should do, and how they should do it, in relation to successful selling and improvement of the industry.

A continuous furnace enameling plant for stove work and jobbing

(Continued from Page 13)

The enamel used by the operators for flanges and overspray contains a color control chemical which has proved helpful in maintaining color standards. The combined automatic and manual spray arrangement just described can deliver 18,000 square feet of good stove ware per 8-hour shift.

No lost time for transfer

of cover coat pressure tanks

At 34' per minute, time in the automatic machine is of importance. To eliminate the necessary time for disconnecting and connecting pressure tanks feeding the automatic machine, our men devised a simple arrangement of pipes and valves at the feed line, including individual delivery shut-off valves.

When one tank is exhausted, it is only necessary to close one valve and open the valve to the second tank, which is already up to pressure, to continue the operation of the machine.

White ware continues from the spray operation on a cable conveyor, through a gas-fired, open flame dryer. As in the case of the ground coat dryer, the gas heat is boosted with heat from the No. 1 furnace recuper-

ator.

At present the recuperator ducts are being divided and arranged with dampers so that approximately one-half of the heat from the recuperator on either furnace is available for the dryers.

The brushing circle

All brushing is done inside a loop or circle formed by the various conveyors and major items of equipment described. At the take-off point of the cover coat dryer, ware is placed on wood shelved racks transported on a monorail conveyor around the circumference of this brushing circle. This conveyor will bank sufficient ware to keep a healthy balance between easily brushed parts and the more difficult parts requiring additional time. Brushing of body sides is accomplished without removing the parts from the conveyor. All other parts are removed to turntable brushing tables, and then returned to the conveyor. Ten girls are normally used for brushing and two for screening.

The screening required for such parts as valve panels and cook charts is done in this brushing section. The loop conveyor serving this brushing

area affords direct transfer to either furnace chain, the separating distance being only 4'.

Reclaim procedure

Our reclaimed enamel is worked over in a simple manner with good results. All possible care is taken to prevent dirt and foreign matter from contaminating this enamel. It is removed from spray booths with stainless steel shovels immediately after spraying stops for the day, and put into enameled 50 gal. drums. Water is added and the enamel is then blunged with a power mixer to a specific gravity of 1.37. One-half per cent of clay and 1/2 per cent of opacifier are added when blunging. The blunged enamel is then screened, passed over a magnet and tested. If test plate shows excessive dirt condition, the enamel is pumped into mill and ground to 2 grams per 50 cc on 200 mesh. A test is made again. It is only occasionally that we lose a barrel of reclaim. Should a bad barrel of reclaim occur, it is set aside for stippling.

Importance of burning tools

At one time we had used conventional 4-point "coat hangers" for all our ware. These tools we found caused flanges to be pulled out, especially on ware fabricated from the lighter gauges of metal. By welding tips (one inch wide at the top, shaped like an equilateral triangle) we have eliminated the "pull-outs" on flanges and kept "drop-offs" in the furnace to a minimum. The "tips" were welded to the 35/15 cast hangers.

Specially designed "A" frames are used to fire lift covers and thus keep them flat as a tolerance of plus 1/32" is requested on this item.

Cast iron department

There is nothing unusual about our department for the application of cast iron enamels. The department includes one box type furnace, a box dryer and two manual spray booths. Parts enameled consist of burners and grates, all of which go in one coat black. We do try to get maximum furnace loads of approximately 2,000 lb. We have developed some reinforced alloy angles for

spacing grates in order to strengthen the load.

Improved temperature control

At present we are experimenting with an improved method of temperature control. While this work is in its early stages, the application of some comparatively simple changes to the usual control equipment has enabled us to produce a straight line temperature curve on the one furnace where the changes were made. We expect to check this further by an installation on the second furnace, and if the early findings are corroborated the information will then be made available.

To date our improved method of temperature control shows that regardless of how the furnace chain is loaded (light, heavy, spasmodic,

or suddenly becoming empty as at lunch time), the temperature of the furnace is held constant. In other words, we find today that a light load or a sudden "no load gap" does not "shoot" the temperature up and a heavy load does not pull the temperature down. Very little to no attention is now required for controlling the furnace with the new temperature control setup.

Photo-electric inspection

All finish coat ware is inspected visually for defects at the transfer point from the finish coat furnace chain to the shop conveyor. Production and reject data are procured at this point, and all rejects marked with phenolphthalein.

The shop conveyor carries the OK'd ware to a second floor matching and

inspection section. Parts are first placed on a table and subjected to photo-electric inspection for color graduation and classification. Then, under fluorescent light, on a sloping inspection board, the parts are put up in sets and checked for color match at flanges.

These sets are then packed and shipped in matched sets to customers, or sent to the mounting line of our parent company, Grand Home Appliance Company.

Maximum production at hi-speed

Parts in white for 550 stoves can be produced on our setup in 8 hours. Equipment is so set and synchronized that raw steel entering the pickle room can be on its way to assembly in one hour and thirty minutes.

American Ceramic Society Pacific Coast meeting

held in Los Angeles, October 16, 17 and 18

A.C.S. NEWS FLASH

The Southern California Section of the American Ceramic Society entertained representatives of the ceramic industry at the Pacific

Coast Regional meeting, October 16, 17 and 18.

Two hundred and fifty engineers, technologists, designers and factory managers came to discuss the scientific progress of the industry and to listen to 31 papers on technical and operating subjects.

John D. Sullivan, president, pointed to the dwindling supplies of metals and to the inexhaustible quantities of ceramic minerals. He said that Portland cement production now exceeded in tonnage the output of iron and steel. Glass is now produced in larger quantities than all of the non-ferrous metals. This will lead to more extensive use of ceramic products especially in the engineering field. Ceramic production is on a long upward trend which will continue for several years.

Carl Harbert, Cleveland, Ohio, showed examples of where the Germans were ahead of other countries

in the development of substitute materials for ceramic use. An important development was a synthetic substitute for borax.

He gave details of the various branches of the ceramic industry, gleaned from experiences on his recent trip to Germany.

At a dinner on Thursday evening, October 16, Clyde Williams, president of the American Institute of Mining and Metallurgical Engineers and director of Battelle Memorial Institute, said that ceramic products were indispensable in the development of guided missiles for military use and for the application of atomic power to peace time production. This is due to the high temperatures used which far exceed the operating limits of the available metals and alloys. The extensive research work of the past few years has made ceramic materials available for these uses.

Millard Sheets, director, the Art Department, Scripps College, called attention to the necessity of producing materials of satisfactory design, both for artistic reasons and utilitarian purposes. He said that each age is remembered largely by the design of the products of the times.

He made a special plea for good American design in art ceramic where it is in direct competition with foreign ware. He said that American designers and manufacturers are capable of producing the best ceramic ware on earth.

Group sessions were held to cover discussions of glass, both containers and sheet; whitewares, including tableware, art pottery and electrical porcelain; structural clay products for the building industry; refractories for iron and steel, and for non-ferrous metals; and porcelain enamels for household and building uses.

The design division, which is the most active specialized local section, discussed plans for the improvement of ceramic design and for better American art ware.

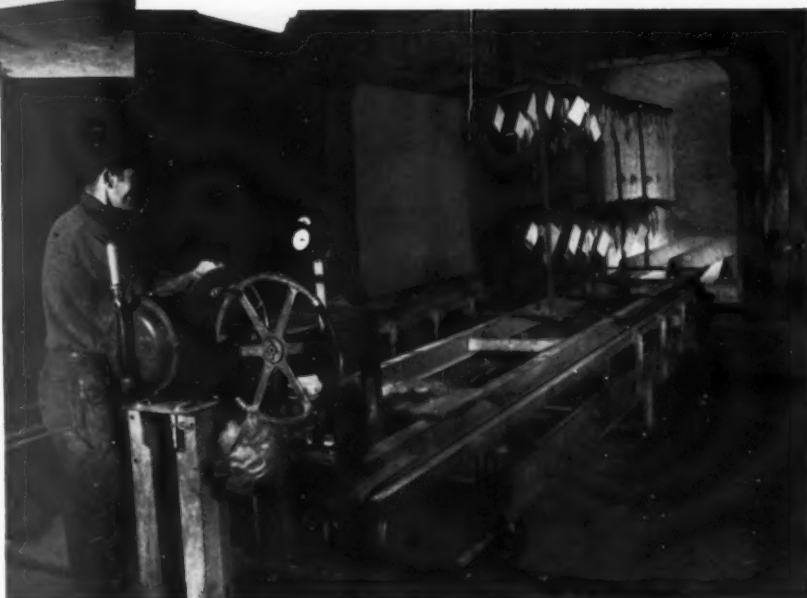
Twenty-five members of the American Ceramic Society, representing as many companies, came to the coast for this meeting. Many of them presented papers.

The meeting concluded Friday evening, October 18, with plant trips arranged for Saturday, including a joint session with the local chamber of A.I.M.E. and a visit to the Kaiser steel plant at Fontana.



In Box Furnace or Continuous
On all types of ware
CENTURY FRITS
DO the job

In this plant large multi-covered signs are being fired in a continuous furnace, while a variety of both large and small parts are fed to a high side wall box-type furnace. This is another plant where "Century" frits are used exclusively.



In the "Century" line of time-proved enamels there are frits designed for every type of ware. Large parts, small parts, heavy gauge, light gauge, multi-colored or white — "Century" has the enamel for the ware, and to fit the enameling equipment.

Ground coats by "Century" have won their way into the plants of the country's leading enameling plants. They stay in, too, for they are easy to apply and produce a vise-like bond on almost any kind of steel. There are cover coat enamels of every type, including the new Titanium No. 77, which give just the right finish to meet your individual needs.

And don't forget that every pound of frit that carries the "Century" trade mark has been plant-proved on production work before it is offered to you. Ask for a demonstration now and judge for yourself. Phone or write . . .



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